

Psychological Bulletin

Forty-ninth Annual Meeting
of the
American Psychological Association
Northwestern University

Wednesday, Thursday, Friday, and Saturday
September 3, 4, 5, 6

1941

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Registration and Informal Gatherings at Headquarters in the Student Lounge, Scott Hall, will be held throughout the meeting.

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THE HISTORY OF THE UNITED STATES

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PROGRAM

GENERAL

Wednesday, September 3, 9:00 A.M.

Room 107, Harris Hall

HERBERT S. LANGFELD, Chairman

9:00 A.M. *The Fields of Psychology as a General and a Special Science.*
RICHARD LEDGERWOOD, Warrensburg, Illinois.

Sign-function analysis of the type cultivated by members of the Vienna Circle and now being advanced by the preparation of an *Encyclopedia of unified science* leads to a consideration of the logical structure of scientific pursuits themselves and articulation of the distinct concerns of the several disciplines. One possible system posits coemption of the domain of natural systems by physics, biology, and psychology ranged in a transitive order of dependency and narrowing scope reminiscent of that postulated earlier by C. Lloyd Morgan.

The present paper proposes a definition of psychology as the scientific study of natural persons, both individual and collective, and traces application of the distinctive approach dictated by its special subject matter to the inclusive domains of biology and general physics. One interesting result noted is a reconciliation of historically competing views of the field of psychology—the psychology of ‘mind’ marking the field of general physical psychology, that of ‘consciousness’ or sentiency the common subject matter of biological psychology, and ‘personality’ the type of psychology as a special science. The corresponding concepts are exactly defined.

The preoccupation of general physiology with the internal relations and of general ecology with the external relations of natural systems is contrasted with the composite, synoptic character of psychology and sociology, the latter being differentiated in terms of an analytical distinction between phase and station. The species of appropriate mathematical formulation is indicated.

The immediate advantage of these systematic interpretations in scientific practice is illustrated by reference to the orientation of psychometric investigation and their heuristic value in clarifying the fundamental problems of motivation, affect, and appetite. J. H. Woodger's construction of the living organism as a four-dimensional substrate lends itself to psychodynamic interpretation in the latter connection. [15 min.]

9:20 A.M. *The "Validation" of Drives.* GEORGENE H. SEWARD, Connecticut College.

Operational definition has led to the identification of drive with behavior. Thus we have defined drive as "an activity of the total organism resulting from persistent disequilibrium." Recently Anderson has made more explicit the distinction between "drive," the neural mechanism that results in behavior, and "need," the instigating physiological state. He further suggests that conditioning may effect a shift in dependence for arousal from the original internal to a new set of external stimuli. Not only does this trend toward externalization characterize individual development, but the literature reveals a phylogenetic parallel. Increasing capacity for learning is correlated with increasing capacity for externalizing drives. However, the assumption of equivalence between operationally identical behaviors, regardless of origin, is fraught with the danger of misinterpretation. As Lewin reminds us, we are no more justified in postulating absolutes in the field of motivation than in the field of perception. A given behavioral item has different significance in the life economy of the organism according to the whole in which it is embedded. Eating to make up a food deficit means something very different from eating to compete socially with other individuals, just as copulation to satisfy an internal need means something very different from copulation to dominate another individual.

To avoid ambiguity of interpretation the writer suggests differentiating similar behaviors according to source of stimulation. This would amount to "validating" the vegetative drives by some criterion of internal need, such as deprivation interval or genital phase. Such indices are as objective and as easily quantified as the behaviors which they induce. Their application should prevent confusion by enabling us to evaluate a given behavior pattern in the light of the more complete situation in which it occurs. [15 min.]

9:40 A.M. *Factor Analysis—Art or Science?* EDWARD S. BORDIN, University of Minnesota.

Orthodox factor analysis studies cannot be viewed as experimental researches for scientific data. The primary purpose of factor analysis has been precise and systematic description. But the data provided cannot be regarded as experimental, since the final yield (in terms of factors) is dependent upon the factor analysts' presuppositions, *i.e.* "g," "vectors," "mosaics," and so on. The nature of the design of experiment in orthodox factor analysis does not permit an independent test of the presuppositions which largely account for the kinds of results reported. Thus, these methods of factor analysis must be regarded primarily as arts of description which in themselves do not establish scientific facts.

The method of inverse factor analysis based upon the intercorrelations of persons does offer a medium for experimentation which may meet the scientific criterion of independent verification. In this design of experiment the factors are located in persons and consequently can be identified by exact statistical and experimental procedures which are independent

of any presuppositions or assumptions. Methods for the identification of factors derived through inverse factor analysis are described.

Further support of inverse factor analysis as a method of experimentation can be based upon the personalistic theories of Stern and Allport and upon interbehavioral theories of Kantor. If either of these two kinds of systematic constructs offers possibilities for the discovery of new scientific data in the field of psychology, it seems likely that the method of intercorrelation of persons and of inverse factor analysis will make these discoveries possible.

An example of an experiment designed to test interbehavioral theory in the social psychology of the college situation will be described. This study is an attempt to establish determinants of social participation. It is assumed that these determinants can be found in the reactional biography of the subjects. The design of the experiment and some preliminary results will be discussed. [15 min.]

10:00 A.M. *Art or Science in Clinical Psychology.* THEODORE R. SARBIN, University of Minnesota.

The practice of clinical psychology is regarded by many as an art rather than a science. To determine the plausibility of this statement, it is necessary to examine the behavior of clinical psychologists in action. If the facts obtained from such an examination support the proposition that clinical psychology is an art, then we are faced with the difficult task of training clinicians in certain forms of artistry. A discussion of the various conceptions of art as related to clinical work leads to the conclusion that the implicit talents of the artist are not readily communicated. So-called intuitive behavior of clinical psychologists which passes in the name of art is not communicable to others and therefore lies outside the pale of scientific discourse. Where the clinician's behavior is communicable (and therefore teachable), we are dealing with observable phenomena, not with dazzling "intuitions."

Such an examination of the behavior of clinical psychologists reveals that they perform two main functions: diagnosis and treatment. These functions are analyzed in order to determine whether they are fulfilled by some superempirical process or by empirical science. In examining the concept of diagnosis, evidence is presented which supports the notion that a diagnostic statement has meaning only when it has a referent in the future, *i.e.* when it provides a prediction of behavior. Literary diagnosis (symptom-description) has no utility in the clinic because it lacks predictive value. As Reichenbach has shown, predictions of behavior must be expressed in the form of probability-statements. The probability-statement or prediction is determined empirically and may be stated in terms of a statistical regression equation, such as $X_0 = b_1X_1 + b_2X_2 + C$, or in terms of a crude clinical generalization from previous cases. An example of the latter would be: If a clinician's experience has shown an association of antecedents X, Y, Z with the consequent "delinquency" in 80 out of a 100 cases, the diagnosis could be meaningfully stated as "potential delinquency." It is clearly seen that meaningful (*i.e.* predictive)

diagnoses are determined empirically rather than intuitively. The clinician's treatment function is considered similarly. [15 min.]

10:20 A.M. *The Concept of the Goodness of the Organism: A Critical Study.* JAMES D. PAGE, University of Rochester.

Intercorrelations of physical and mental traits, as well as studies on gifted children, indicate a tendency for good traits to go together. This finding may be attributed either to a general biological quality of the organism or a general environmental advantage. Fraternal twins provide a convenient medium for determining the relative validity of these two interpretations in that they differ in hereditary endowment but share a common social environment.

A battery of intelligence tests, personality rating scales, psychomotor tests, and physical measurements were made on 50 pairs of like-sexed fraternal twins with the following results:

(1) The twin scoring higher on the Stanford-Binet does not differ significantly from the other twin with respect to the Porteus Maze Test, Cornell-Coxe Performance Scale, Goodenough Drawing-of-a-Man Test, strength of grip, height, weight, visual acuity, or auditory acuity.

(2) Teachers' ratings on personality and social traits tend to favor the brighter of the pair—due likely to the "halo effect."

(3) In approximately one out of five pairs, fraternal twins differ in hand preference. The left-handed member is neither less intelligent nor more prone to speech disorders.

This study was done in collaboration with Mary M. Gazley. [15 min., slides.]

10:40 A.M. *Misconceptions Regarding "Applied Psychology."* JOHN G. JENKINS, University of Maryland.

The following assumptions regarding "applied psychology" are clearly recognizable in critical articles and discussions: (1) that the term "applied psychology" can be usefully employed to describe a field sufficiently homogeneous to be classified under a single name; (2) that "applied psychology" employs facts or methods developed by "pure" psychology and that it must wait for the former to develop them; (3) that research in the applied fields is a search for the useful, while research in pure psychology pursues the truth for its own sake.

These assumptions will be shown to be false. Citations from published articles will be used to document each of them.

The following substitute assumptions will be defended: (1) that the term "applied psychology" has, by equivocation, been commonly used to describe three disciplines which differ in aim and in method and which have no important differentia in common. Clear thinking regarding the applied fields is impossible unless each of these disciplines is designated by a distinguishing name; (2) that psychotechnology, like all other technologies, has developed its own methods and its own generalizations, and that it is much rarer for the applied discipline to borrow from "pure" science than to proceed toward an experimental solution along lines pecu-

liar to itself; (3) that research disciplines cannot be separated in terms of motivation or aim; and that the distinction between psychotechnology and "pure" psychology must be sought elsewhere. [15 min.]

11:00 A.M. *A Practical Concept of Neurosis.* KNIGHT DUNLAP, University of California at Los Angeles.

Starting from cases which are commonly classed as neuroses, comparative analysis has led to recognition of a fundamental syndrome basis, in spite of the great variation in particular symptoms. This conception of neurosis cuts across the antiquated distinction between so-called "functional psychoses" and "neuroses," so that a new name would seem appropriate. However, it seems possible to clarify and extend the present applications of the term neurosis to cover the requirements.

Study of the etiology of neuroses leads to important conceptions concerning causal patterns and of the distinction between neurosis and mere perturbation. Similar distinctions regarding abnormal behavior of rats may clarify the present confusion of diverse conditions under the name of "neuroses." [15 min.]

11:20 A.M. *Two Basic Postulates of Field Theory, and Their Experimental Justification.* RALPH K. WHITE, Cornell University.

"Field theory," in this discussion, will mean the assumptions which are made by both Tolman and Lewin, but not by Thorndike, Hull, and other consistent S-R psychologists. It is here suggested that two of the Tolman-Lewin assumptions are basic, that they can be stated in a logically rigorous and operationally meaningful form, that their operational implications are distinctly different from those of S-R psychology, and that they are well established experimentally. They can perhaps be regarded as "obvious common sense," but not as metaphysical, meaningless, or lacking in experimental justification.

The two postulates can be called the "perceptual learning hypothesis" and the "path-goal hypothesis." To state them in simple, familiar words involves losing some, but perhaps not too much, of the full meaning which they have when expressed in the more elaborate terminologies of Tolman or Lewin. In simple words, the perceptual learning hypothesis is: "If a particular piece of behavior is soon followed by perception of a particular object, there will be an increased tendency—when the same situation is presented again—for an 'idea' to occur, in which that behavior is represented as a path to that object." And the path-goal hypothesis: "If there is a motive, the goal of which is a particular object, and if at the same time there is an idea representing a particular piece of behavior as a path to that object, that behavior will tend to occur."

An attempt will be made to show how these two postulates are related to the law of effect, and also to certain relatively crucial experiments, especially those of Spence and Lippitt, Leeper, Zener, and Wallach and Henle, and the latent-learning data of Blodgett, Tolman and Honzik, Buxton, Porter, Wallace, and others. [15 min., slides.]

11:40 A.M. *Man's Creative Years in Philosophy.* HARVEY C. LEHMAN, Ohio University.

This study attempts to ascertain the chronological ages at which outstanding philosophers have made their most significant philosophical contributions. The birth and the death dates of the philosophers, and the dates of their more important contributions, were obtained by canvassing more than 50 books which deal with the history of philosophy. The philosophers' principal writings were identified: (1) by tabulating the frequency with which their various philosophical writings were mentioned and discussed in the histories of philosophy, and (2) by noting the frequency and the unanimity with which the historians characterized a particular book as the author's "chief work," "principal work," "most important work," and the like.

Performance age curves have been constructed which take account of the death rate of the philosophers and which reveal the relative frequency with which each age group has contributed philosophical works which have come to be regarded as classics. As regards their general shape, these age curves do not differ greatly from the age curves that have been obtained for scientists, artists, composers of music, etc.

The present study was made in collaboration with Dr. W. S. Gamertsfelder, dean of the Graduate College and the College of Arts and Sciences and professor of philosophy and ethics, Ohio University. [15 min., slides.]

CLINICAL

Program Arranged in Collaboration With the
American Association for Applied Psychology

Wednesday, September 3, 9:00 A.M.

Room 100, Speech Building

DOUGLAS H. FRYER, Chairman

9:00 A.M. *The Development and Evaluation of a Measure of Counseling Interview Procedure.* ELIAS HULL PORTER, JR., Ohio State University.

It is assumed that counselors' conceptions of the goals and nature of treatment operate to determine the types of techniques used in the discharge of common functions from one interview to the next. On the basis of this assumption an intensive analysis of textbooks on counseling and of phonographically recorded interviews was made for the purpose of making a job analysis of the interviewing techniques. A series of descriptive categories, covering different types of techniques, was formulated into a check-list against which 13 judges measured 19 interviews. These interviews were selected to include a wide range in the experience of the counselors involved, a sampling of interviews from different positions within the interview series, and definite differences in the point of view held by the counselors. Despite relatively brief training in the use of the check-

list, significant agreement between judges was obtained both when the interviews were presented in type-script and in phonographic form. Validity was estimated through the agreement between judges' ratings of the interviews and check-list scores derived through category weights assigned by experts. Validity was further estimated through the agreement between differences evidenced through the use of the check-list and differences which were known to exist by design. Because of the limitations imposed by the number of available interviews and judges, only tentative analyses are suitable. Distinct patterns of techniques were apparent. Analysis of the interviews of individual counselors showed similar patterns of techniques from one interview to the next within a series. One counselor-in-training showed a progressive shift in technique pattern as the interviews continued. Measurement of interviewing techniques has implications for counselor training and clinical research. [15 min.]

9:20 A.M. *Constructive Therapy for Adults.* DOROTHY HAZELTINE YATES, San Jose State College.

The aim of the writer, as a consulting psychologist, has been to develop methods of psychotherapy which emphasize immediate reconstruction rather than prolonged investigation, methods which are essentially remedial rather than largely diagnostic. Study and treatment of 491 adults form the basis for the conclusions here reached. The procedure has been to observe, question, test, and—above all—listen to the client and often his relatives and associates as well; to see that the client observes the rules of health and has any necessary medical treatment; to arrange for, and engineer, family or business adjustments or perhaps new interests and hobbies; and, at the same time, to make use of whatever specific psychotherapy seems appropriate. The following conclusions are offered: (1) No one method can be used for all, since individuals vary. Evidence is presented that Freudian psychoanalysis is distinctly harmful to some Americans. Psychoneurotics, in particular, need to be directed away from introspective, self-centered ideas. (2) The client needs to develop constructive, dynamic ideas, ideas that lead to a new way of life. He needs to replace fear, muddled thinking, helplessness, etc. with confidence, a hopeful philosophy of life, and a problem-solving attitude. Certain techniques for effecting these changes are discussed. (3) Many of the findings of experimental and theoretical psychology can be used in therapy, e.g. the facts and procedures regarding habit, conditioning, motivation, emotion, hypnosis, and suggestibility. (4) Psychotherapy is quite as much an art as a science. The results depend largely on the ability of the therapist to inspire his client to use all his powers. [15 min.]

9:40 A.M. *Aptitude Determinations in the Field of Clinical Psychology.* M. CLAIRE MYERS, Institute of Child Welfare, University of California.

This report grows out of an investigation the aim of which was to construct an aptitude test which could be used to predict success in the field of clinical psychology. Since success in training courses is a prerequisite to actual practice in the field, and since criteria of success in field

work are difficult to obtain, the present investigation was limited to the prediction of success in clinical psychology courses.

The final form of the aptitude test, consisting of two subtests, was administered to a group of 150 prospective students in clinical psychology at the University of California, before they had taken any clinical courses.

The test had a reliability coefficient of .92. The correlation between test scores and final course grades was +.79. A multiple correlation of +.82 was obtained between final course grades and test scores combined with grade point averages. [10 min.]

9:55 A.M. *A Statistical Analysis of the Factors in Psychoclinical Diagnosis and Procedure.* RALPH M. STODDILL, State Bureau of Juvenile Research, Columbus, Ohio.

A follow-up study was made to determine the community adjustment of 178 boys who had been studied previously at the Bureau of Juvenile Research because of sexual delinquencies. These results were presented at the 1940 meeting of the A. P. A. and A. A. A. P.

The present study represents a further analysis of these same cases in an effort to arrive at the basis of prognosis, or the factors which influenced the psychologist in estimating the child's chances of making a successful adjustment after study. Tetrachoric coefficients of correlation were computed to determine the extent to which age, intelligence, race, stability of behavior, cottage behavior, home background, parental treatment, prognosis, adjustment, and other such factors were correlated with each other.

When the correlation of various factors with prognosis is compared with the correlation of these same factors with adjustment, it is possible to evaluate the ability of the psychologist to predict adjustment. It was found, for example, that the influence of chronological age on adjustment was underestimated, while the influence of intelligence quotient was overestimated. Such factors as the stability of the child's behavior and cottage adjustment were also more highly correlated with prognosis than with afteradjustment.

On the basis of this correlational analysis suggestions are made for improving the prediction of such cases in the future. [15 min.]

10:15 A.M. *A Biological and Psychological Report on a Pair of Monozygotic Mongoloid Twins.* NORMA FORD, University of Toronto, and SYLVIA FRUMKIN, Northern New Jersey Mental Hygiene Clinics, Greystone Park, New Jersey.

Monozygotic (or identical) twins among mongoloid imbeciles are rarely encountered, and in only 2 out of 13 cases cited in medical literature has an adequate analysis of the type of twinning been given.

The present report contains a biological analysis of twin girls, 14 years of age. The diagnosis is based on a study of the skin patterns of the hands and feet, as well as physical measurements (skin, hair, eye color, etc.) and blood groups. From these data the monozygosity is established.

Part II contains the psychological findings and socioeducational observations, many of which are somewhat unusual. These facts were established through frequent contacts over a period of years. [10 min., slides.]

10:30 A.M. *Psychosomatographs of a Case of Hypogonadism Before and After Treatment.* HERMON W. MARTIN, Emory University.

The primary aim in this study was to determine somewhat quantitatively the psychological changes that might accompany the more frequently observed and measured physical results of hormone treatment in pronounced cases of hypogonadism.

Following a physical checkup on a 17-year-old boy, who was brought to the university hospital for respiratory complaints, it appeared that the chief difficulty was general underdevelopment associated with his glandular disturbance. As treatment with testosterone propionate was begun, the diagnosing physician invited the writer to make a psychological study of the patient. Several mental, temperamental, and other measures were made in September, 1940, and repeated in February, 1941. Posttreatment measures were done again in June.

The changes in personality have proven to be quite as definite and interesting as those in the physical realm. [10 min., slides.]

10:45 A.M. *Fetal Irradiation and Microcephalic Idiocy: Report of a Case in Litigation.* EDGAR A. DOLL, The Training School, Vineland, New Jersey.

Maternal pelvic irradiation of sufficient amount appears to produce grave alterations in the development of the human fetus. One consequence is the artificial production of mental deficiency, and especially microcephaly. A case is reported which combines unusual clinical manifestations with important legal ramifications. The court action involved such issues as (a) the right of the child to recover judgment for damages sustained *en ventre sa mère*; (b) the status of the psychologist as an expert witness and the limits of competent testimony; (c) the fact, nature, degree, methods of determination, and presumptive as well as possible etiology of such allegations as idiocy, microcephaly, prematurity, Little's disease; (d) the relation of therapeutic X-ray treatment to the alleged production of such sequelae; (e) the social consequences, life expectancy, cost of care in such cases for assessment of damages. The report is presented (a) as another instance of a comparatively rare clinical syndrome, (b) with regard for conflicting alternatives, (c) with comment *re* academic *vs.* legal plausibility, (d) with notes on the role of the psychologist in court, (e) with brief implications regarding the adventitious production of organic inferiority, and (f) with suggestions for equivalent conditions in animals. [15 min., slides.]

11:05 A.M. *A Quantitative Investigation of the Variability of Reaction as a Measure of Emotional Stability.* PAUL M. FITTS, University of Tennessee.

This report presents the results of preliminary efforts to develop a test of emotional stability. The assumption is made that increased variability of reaction, following an increase in the complexity or irritability of a task, is one significant measure of emotional stability.

The subject faces a darkened stimulus panel. On this panel are located

four small bright lights. Each light is 22° from the center of vision along one of the major axes of the panel. Whenever one of these lights is turned on by the operator, the subject responds by moving a "joy stick" in the corresponding direction. The time of each response is recorded in thousandths of a second, and errors, anticipations, and blockings are noted. A series of 50 trials is given under these conditions.

Two distracting stimuli are then introduced, and another series of 50 trials is given. The distractors are a buzzer, which is sounded intermittently at irregular intervals of about three seconds, and a bright light or "glare" stimulus, located in the center of the visual field, which blinks on and off irregularly at intervals of about one second.

Results will be reported on groups of Civil Aeronautics students, athletes, "well-adjusted" college students, and "neurotic" cases. Relation of variability indices to neurotic inventory scores and clinical ratings will be discussed, and data on test-retest reliability presented. Possible applications will be considered. [15 min., slides.]

11:25 A.M. *The Quantitative Study of Language Behavior.* WENDELL JOHNSON, University of Iowa.

This report sets forth the outlines of a program of research on language behavior. The program as a whole is designed to develop reliable and differentiating measures of specified aspects of language behavior; determine the intercorrelation of the resulting measures; determine the degree of correlation between these measures and other variables involved in environmental influences, physiological conditions, intelligence, and personality adjustment; apply the measures to a comprehensive investigation of language development; determine the modifiability of language behavior as measured; determine the relation between modification in language behavior and modification in other aspects of behavior; indicate the normal characteristics of language behavior and the varieties of disorder in terms of the measures used.

Two completed investigations of written and spoken language, involving the analysis of approximately 200,000 words obtained from 34 university freshmen and 34 schizophrenic patients, will be presented. The individual language samples were from 2800 to 3000 words in length, and each sample was analyzed in terms of the frequency of occurrence of each word used, the proportion of the words falling in each grammatical category, the type-token-ratio (a measure of vocabulary diversity which expresses the ratio of different words used to total words), proportionate vocabulary (the number of different words making up specified proportions of the total sample), and certain ratios expressing the relative frequency of occurrence of specified types of words. Comparisons will be presented between written and spoken language and between the language, written and spoken, of university freshmen and schizophrenics. The theoretical implications of the findings will be discussed, and further studies, now in progress and projected, involved in the program of research will be indicated. The two investigations referred to above have been carried out as Ph.D. dissertations under the writer's direction by Helen Fairbanks and Mary Mann. [15 min., slides.]

BUSINESS AND INDUSTRIAL

Wednesday, September 3, 9:00 A.M.

Room 104, University Hall

HAROLD E. BURTT, Chairman

9:00 A.M. *A Comparison of Two Methods for Investigating the Attention Value of Advertisements.* JAMES S. KARSLAKE, Ohio State University.

Using the Purdue Eye Camera, an investigation was made of the attention value of a number of advertisements precisely as they appeared on publication in the *Saturday Evening Post*. In this investigation, a study was made of the eye behavior of 100 people while they were in the act of leafing through the pages that were of interest to the investigator.

Previous work had shown the method to be reliable and valid, with coefficients of reliability and validity ranging from .96 to .99.

The correlations between attention value as disclosed by this method and the results of a nationally known questionnaire type of survey ranged from .14 to .42—values so low as to indicate that the two methods did not yield measurements of the same thing.

A trial survey of the questionnaire type, using a group of 143 people, gave evidence to indicate that the questionnaire method yields an evaluation of a number of advertisements appearing as part of a series, while the results obtained with the Purdue Eye Camera are an evaluation of specific insertions of copy. [15 min., slides.]

9:20 A.M. *Attensity of Isolation as Evaluated by Means of Ocular Photography.* HERMAN F. BRANDT, Drake University.

The purpose of this study is to evaluate by means of ocular photography the attention value of isolation when varying the white space surrounding a given field.

Four exposure cards the size of a standard double-page magazine spread were prepared with 0, 25, 50, and 75% white space surrounding each of four pictures mounted on the left half of the spread. A picture the size of a page was mounted on the right-hand page and served as a competitor in the experiment.

One hundred and twenty college students observed the four cards for a period of 10 seconds, but no subject was informed of a time limit. No subject saw more than one card. The ocular patterns were recorded by an eye-movement camera developed by the author.

The results of the analysis reveal that each succeeding reduction in pictorial area or increase in white space is accompanied by a consistent decrease in attention time.

Attention time resulting when observing cards with 25% or more of white space does not equal the attention time when all space is filled. The losses of attention time for white space of 25, 50, and 75% of the total field are 7.54, 21.01, and 26.41, respectively. This ratio of attention time to white space is significantly greater than the square root ratio

obtained when size is the only variable. Advertisers purchasing space will gain most attention time per unit of space by reducing white space to less than 25% of field under consideration. [15 min., slides.]

9:40 A.M. *Variations in Work Performance Under Normal Industrial Conditions.* EDWIN J. KUNST, Central Y.M.C.A. College.

One month's continuous records of the work performance of 20 billing-machine operators working under a wage-incentive plan in a public utility office were obtained by a method which minimized interference with normal work routines. Parallel records of changes in euphoric tone of individual workers and records of environmental conditions were obtained.

The daily, hourly, and quarter-hourly output variations of each worker were studied. Work-curve analysis revealed marked variations in speed and accuracy of work from period to period and marked variations in the individual work-curve patterns from day to day. Composite work curves for individual workers and for the group as a whole were found to be unreliable as indicators of typical work-curve patterns.

Most of the workers tended to make fewer errors on days when they worked more rapidly. The more rapid workers tended to be less variable in speed of work than the slower workers, and the more accurate workers tended to be less variable in both speed and accuracy than the error-prone workers.

Factors significantly related to changes in daily average efficiency included (a) amount of involuntary waiting time and (b) relative humidity of atmosphere. Factors found to have no significant relation to changes in daily average efficiency included (a) changes in euphoric tone, (b) hours of sleep preceding the working day, and (c) uniformity of variety in work activity during the day. The probability of significant multiple relations between these factors and work efficiency is discussed. [15 min.]

10:00 A.M. *The Values and Limitations of Employee Attitude Studies.* HERBERT MOORE, Business Research Corporation, Chicago.

The values are in three areas: (a) spotting potential human danger centers, (b) disclosing unsatisfactory line organization relationships, (c) revealing minor environmental sources of irritation. The limitations are due to lack of employee identification and to inadequate personnel. Some of the results of recent studies are reviewed. [10 min.]

10:15 A.M. *Analysis of Results of Tests Administered to Men in the Engineering Defense Training Courses.* BRUCE V. MOORE, Pennsylvania State College.

Batteries of tests were administered to approximately 10,000 employees in engineering defense training courses. Chief among the tests were Otis Self-Administering, Minnesota Paper Formboard, Bernreuter Personality, and Strong Vocational Interest. These scores, with educational training, experience, ratings on the job, and grades in the engineering defense classes, with other personal data, were placed on Hollerith cards. Distributions of scores for various groups will be presented, and

some of the more important interrelations indicated. In general, the norms for skilled workers at present in industry can be summarized. [15 min.]

10:35 A.M. *A New Theory of Traffic Accident Incidence.* T. W. FORBES and M. A. KRAFT, Yale Bureau for Street Traffic Research and American Transit Association.

Previous investigators have shown certain individuals to sustain more accidents in traffic or industry than the average, and these have been termed "accident-prone" individuals or even "accident makers." Most accident distributions for groups of drivers have been skewed, and many studies have assumed such a skewed distribution to represent the chance of accident to which drivers are exposed.

On the basis of relatively complete records on 482 street car operators on 34 routes, over a period of three years, accident expectancies for each man were developed to take account of several exposure factors. This expected accident distribution was symmetrical while the usual skewed distribution of actual accidents occurred. It is suggested that the driver characteristics related to accidents should be viewed as "preventers" rather than "makers." The normal distribution expectancy would then be modified into the skewed one by the preventative action of skill and other characteristics or by lapses. This concept holds important implications for personnel accident studies, traffic, and other applications. [15 min., slides.]

DRIVE AND ACTIVITY

Wednesday, September 3, 9:00 A.M.

Music Hall Assembly Room

C. E. SEASHORE, Chairman

9:00 A.M. *The Effect of Thyroid Feeding on the Spontaneous Activity of the White Rat.* CECIL W. MANN, University of Denver.

In this investigation 18 adult male white rats were used as both control and experimental groups. The effect on physiological functions of the feeding of thyroid extract was observed by measurement of food intake and changes in daily weight and by the use of a new device for the recording of heart beats. Under ether anaesthetization the mean heart rate of the group was 375 beats per second. Feeding 100 mg./kg. of thyroid extract daily for a period of 24 days increased the mean heart rate to 496 beats per second. The reliability of the method of measuring heart rate when used on 70 adult male rats and when the record was taken for at least 120 seconds was .90 (test-retest method). Spontaneous activity was measured by the number of revolutions made in activity cages over two periods of 24 days—the first period on normal diet and the second on thyroid diet. The reliability of the cages for 36 adult male rats was .96 (odd-even method).

Comparisons of results indicated that, while the feeding of thyroid

extract produced definite changes in food intake, mean weight, and heart rate, there was no difference between the mean activity measured during the normal feeding and that recorded during thyroid feeding. [15 min.]

9:20 A.M. *The Effect of Auditory Stimulation on the Sexual Cycle of the Sparrow.* S. B. CUMMINGS, JR., and C. S. THORNTON, Kenyon College.

The effect of increased illumination in initiating the sexual cycle in certain species of birds and mammals has been clearly demonstrated. In explanation of this phenomenon two theories have been proposed. One of these, the "activity theory" of Rowan, asserts that a supernormal dosage of light is effective by increasing bodily activity which in turn produces metabolic changes that activate the sexual mechanism. According to this theory, stimulating agents other than light should also be efficacious in producing the seasonal changes. In support of this view Rowan advances evidence showing that birds kept in a state of heightened activity by means of tactual and kinaesthetic stimulation can be brought into a sexually active state during the normally quiescent period. He also reports incidental observations showing that city birds reach the breeding condition at an earlier date than country birds in the same latitude. This difference he ascribes to increased activity aroused by street noises. Similar incidental observations have been made by Whitaker on white-footed mice.

The present experiments represent a further test of the 'activity theory' of sexual periodicity.

A group of male sparrows captured during their quiescent period were subjected to intermittent noise from a buzzer for 40 consecutive days. Two control groups were observed over the same period. The first control group was subjected to four and one-half hours of illumination in addition to the normal winter ration of daylight; the second was subjected to no added amounts of sound or light.

At the end of the experiment microscopic sections of the gonads showed no sexual activation in the sound-stimulated or second control groups. The first control group, however, was well advanced in the sexual cycle.

These results present clear evidence that, under the conditions of the experiment, auditory stimulation is ineffective in initiating seasonal sexual changes in the sparrow. The relation of these findings to the current theories will be discussed. [15 min., slides.]

9:40 A.M. *Counteracting the Retarding Effects of Inanition on the Awakening of Copulatory Ability in Male Rats by Testosterone Propionate.* CALVIN P. STONE, Stanford University.

Twenty-four male albino rats were subjected to inanition between the ages of 30 and 50 days. They were fed the same food as the controls, but the daily ration of each rat was limited to an amount which would hold it at the weight reached when 30 days of age. Daily, during the period of restricted ration, the underfed males received a subcutaneous injection of 0.25 mg. of testosterone propionate dissolved in 0.05 c.c. of oil of

sesame. When the animals were 35 days of age, tests for copulation began. They followed daily until each rat was 50 days of age and at less frequent intervals until they were 75 or more days old. If the male hormone had not been injected, the expected delay in mean age of first copulation by the malnourished group would have been approximately 20 days.

For the 24 malnourished males the mean age of first copulation was 42.7 days, as opposed to 49.7 days for 22 littermate controls. For 24 nonlittermate controls, the mean age was 39.4 days. Thus, although there is a delay approximating three days, if the inanition group is compared with a control group receiving the same course of testosterone propionate injections, there is an acceleration of about seven days if they are compared with normal controls receiving no injections.

There was somewhat less stability in sexual aggression in some of the injected males than in the controls. This was most apparent during a short period beginning about five days after injections of testosterone propionate were discontinued. Gradually, stabilization of sexual drive occurred in these individuals following realimentation. [15 min., slides].

10:00 A.M. *Effect of Progesterone Upon Sexual Excitability in the Female Monkey.* JOSEPHINE BALL, Johns Hopkins Medical School.

Because progesterone, an ovarian hormone secreted chiefly after ovulation, has been shown to enhance the effectiveness of estrogens in producing sexual responsiveness in rodents it is not likely to be considered a sex depressant. However, since it prevents ovulation and augments the excretion of estrogens, chronic administration should reduce, rather than increase, their effect on behavior in the castrate, and furthermore, in the intact animal, it should prevent estrous behavior including the homologous preovulatory rise of sex interest which occurs in those infrahuman primates in which this trait has been investigated. These considerations have led to a study of the effect of progesterone upon the sex behavior of the monkey.

Three normal females were injected with 1 to 2 mg. of progesterone daily for the first two weeks following a menstrual cycle in which normal sex behavior had been observed. Ovulation and the accompanying rise of sexual excitability did not occur during the injection period in any case. In two of the animals uterine bleeding occurred three days after the last injection, and this was followed by another normal cycle. In the third female sexual responsiveness rose immediately after the last injection, and ovulation occurred 10 days later.

Sexual excitability produced by estrogens in two castrates was lowered by chronic administration of progesterone.

In seven experiments a single injection of progesterone in various dosages failed to raise the responsiveness of castrates in which sex behavior was not much affected by chronic administration of estrogens.

These experiments show that it is much easier to reduce than to increase sexual excitability in the monkey with progesterone and suggest that this hormone might be tried clinically in cases where medication for temporary reduction of sex tension seems desirable. [15 min., slides.]

10:20 A.M. *Food Appetites in Relation to Activity and the Rate of Learning.* PAUL THOMAS YOUNG, University of Illinois.

Experiments have been carried out upon the appetites of rats in relation to activity-level and the rate of learning. Demand for a given food was controlled by deprivation combined with a prefeeding technique which regulated the degree of approach to satiation prior to a given test.

The activity measured was that of running back and forth between a starting-box and test-foods. Activity gradients during 15 consecutive minutes indicate that two test-foods (sucrose and wheat powder) differ consistently in their effectiveness as incentives. Individual differences, however, are so great that neither activity nor rate of learning can be used as a criterion of appetitive demand.

Evidence obtained by the preference technique indicates that hierarchies of appetites exist, but they cannot be accurately predicted measures of activity and learning. Although there is clearly some relation between appetitive food demands, on the one hand, and running activity, on the other, this relationship is not precise enough to enable the psychologist to use activity as a dependable index for predicting the food preferences of rats.

It is suggested that different, but related, bodily mechanisms determine the activity-level of an animal and the quality of his food selection. [15 min., slides.]

10:40 A.M. *An Experimental Investigation of Acquired Drives.* NEAL E. MILLER, Institute of Human Relations, Yale University.

Much human learning in our society is not directly motivated by primary drives such as hunger and thirst, but rather by acquired drives such as fear of disapproval or desire for prestige. The purpose of this study was to discover some of the principles describing ways in which acquired drives are derived from primary drives.

The first experiments were on anxiety as an acquirable motivation based on pain. Albino rats were placed in a simple apparatus consisting of two chambers separated by a door. One was white with a grid as a floor; the other was black without a grid. Before training, the animals showed no marked preference for either chamber. Then they were placed in the white chamber, received an electric shock from the grid, and escaped into the black chamber through the open door. After a number of such trials, the animals would run out of the white chamber even if no shock was on the grid.

To demonstrate that an acquired motivation (anxiety) had been established, the animals were taught a *new habit without further shocks*. The door (previously always open) was closed. A wheel was uncovered. Rotation of this wheel would open the door. Under these conditions, the animals learned by trial and error to escape from the white chamber by rotating the wheel.

If conditions were changed so that only bar-pressing would open the door, wheel-turning extinguished, and a second new habit (bar-pressing) was learned.

Though persistent, the acquired drive was not functionally autonomous. Trials without shock extinguished it.

Analogous experiments with hunger as a primary drive demonstrated how stimuli acquire appetite-arousing potentials so that they will motivate apparently satiated animals to learn a new habit for food and then to eat it. [15 min., slides.]

11:00 A.M. *The Effect of Interruption and of Failure Upon the Attractiveness of Activities.* DORWIN CARTWRIGHT, University of Iowa.

The coördination of a system under tension to an interrupted activity has permitted the systematic ordering of many different phenomena of motivation. Recent experiments have suggested, however, the importance of success and failure in the interruption studies. The present investigation explores further the role of these variables in determining the attractiveness (valence) of activities.

A technique was devised to measure changes in the attractiveness of several activities at once. Before performing a given activity, the subject indicated on a scale the degree to which he wanted to perform (or to avoid performing) each of 12 activities. An activity was then begun and terminated either by (1) *interruption*, (2) completion which the experimenter interpreted to the subject as marked *failure*, or (3) *completion* interpreted as "average performance." Following each activity the subject again rated on the scale all of the activities.

Under these conditions, where success and failure were stressed, an increase in the attractiveness of the *interrupted task* occurred more frequently than a decrease, but tasks decreased or remained unchanged more frequently than might have been expected from previous experiments. Subjects who at the point of interruption anticipated success yielded an increase; those anticipating failure, a decrease. *Failure* led more frequently than not to a decrease in attractiveness, only one-fourth of the subjects displaying an increase. *Completion*, however, equally often produced an increase and a decrease of the completed task.

The activities not actually performed were divided by the subjects into two groups: (1) tasks "of the same type" as the one immediately affected and (2) tasks "of a different type." The attractiveness of tasks of the first type was influenced by changes in the critical tasks significantly more than were tasks of the second type. [15 min., slides.]

ABNORMAL

Wednesday, September 3, 1:15 P.M.

Room 107, Harris Hall

SAMUEL J. BECK, Chairman

1:15 P.M. *Evaluation of Prognosis in the Functional Psychoses.* MARY PHYLLIS WITTMAN, Elgin State Hospital.

This paper presents the results of the use of the Elgin Prognostic Scale for Functional Psychoses on 816 patients including a follow-up study on the 400 patients used as subjects in our preliminary report given at the A. P. A. last year. Six hundred and seventy-six of these pa-

tients are classified as schizophrenic, and 140 as cases of manic-depressive psychosis.

The prognosis scores distribute themselves along a continuum that can be labeled "process" schizophrenia at one extreme and manic-depressive psychosis at the other—with the schizophreniform cases between these two extremes.

The follow-up study indicates conclusively that the prognosis scale is a better index in predicting outcome in these "functional" cases (either with or without shock therapy) than the usual subjective generalizations based on "feeling" or "intuition." [15 min., slides.]

1:35 P.M. *Psychometric Patterns as an Aid in Differential Diagnosis (Schizophrenia vs. Manic Depressive)*. ALBERT I. RABIN, New Hampshire State Hospital.

Most attempts to use psychometric results as an aid in psychiatric differential diagnosis have failed. Such work was based largely on results derived from scales standardized for children and not for adults. The age factor as a variable in mental functioning has been neglected.

The present study aims to compare patterns of mental function based on the Wechsler-Bellevue Intelligence Scales which have been standardized for adults. Seventy-eight schizophrenic and 40 manic-depressive patients have been examined by means of this test.

Significant differences between the Verbal and Performance IQ discrepancies have been obtained, the schizophrenic having a higher verbal IQ while the opposite was true in the others. The factor of individual differences must be considered, however.

A special schizophrenic index (reported in another study) shows that significant differences between the mean indices of the two groups exist. This index may be an aid in differential diagnosis. Investigations with other types of psychosis are under way. [10 min., slides.]

1:50 P.M. *Implications as to the Meaning of Superior "Perceptual Flexibility" in the Visual Sphere Among Normal Children, When Contrasted With Feeble-minded of Like Mental Age*. ALICE PHILP, Institute of Child Welfare, University of Minnesota.

Weigl, Goldstein, and Vigotsky each have reported impairment among mental patients in ability to sort spontaneously certain visual materials on the basis of more than one category. Separately, Bolles, Kounin, and the present investigator, comparing feeble-minded with normal children of like mental age, have found the feeble-minded significantly inferior to normals in capacity for shifting similar perceptual organizations. Bolles interpreted her results as indicating *concrete* behavior in the mental patients and feeble-minded and *abstract* ability in the normals. Kounin discarded this interpretation, substituting an elaborate extension of Lewin's ideas regarding *rigidity* in the feeble-minded as a better theoretical basis for predicting behavior in mental defectives.

These theoretical conclusions may be criticized as premature, since (1) tests were all on a simple, visual, perceptual level (Lashley has pointed out that the discriminative behavior of rats varies tremendously

with the specific nature of the stimulus and of the sense modality—this may be true in humans too); (2) instructions required understanding of the verbal concepts "same" and "different"; (3) on other types of test material (particularly, in Kounin's case, "transfer of training"), which should also have verified the concluding theories, when differences appeared between normals and feeble-minded they were apparently age differences. Experiments have been designed which meet each of these points.

This field of research is of extreme importance since it may lead to a deeper understanding of both mental deficiency and intelligence. Certainly it offers a very concrete method of attack and an important supplement to the so-called studies of concept formation which approach merely the "associational" angle of their own problem. Methods have been worked out for analogous work in comparative psychology. [15 min., slides.]

2:10 P.M. *How Near Normal Are Tubercular Patients in a Public Sanatorium?* IRVIN T. SHULTZ, Friends University.

During the academic year of 1939-1940, aided by a grant from the Indiana University Psychological Clinic, 82 men and 93 women tubercular patients at Sunnyside Sanatorium near Indianapolis, Indiana, were compared with representative groups in the normal population by the following instruments: the Pressey Tests, with reference to education and intelligence; the Barr Scale as to socioeconomic status and vocations; the Minnesota Clerical Test for clerical ability; the Kuder Self-scoring Preference Record for vocational interest; and the Berneuter Personality Inventory for emotional adjustment.

No statistically significant differences were found except on the Bernreuter schedules. Here, both the men and women at Sunnyside were more neurotic, more lacking in self-sufficiency and self-confidence, more introverted, more submissive, and more gregarious than the norms for the general population. [10 min.]

2:25 P.M. *The Personality of the Institutional Psychotic Epileptic.* J. ANDREW GOTTSCHALK, Northwestern University.

Eighty-five institutional psychotic epileptics were included in this study. Objectivity of definition and description of this personality was one of the major aims along with the correlation of various history factors with the present status.

The Babcock Deterioration Scale, the Humm-Wadsworth Temperament Scale, a weighted check-list of traits by doctors and attendants, and careful study of case-history material were the basic methods employed.

Definite personality patterns were found, and a definition was formulated from these objective bases. This study is an initial one of a series endeavoring to distinguish the various epilepsies and the concomitant personalities. [15 min.]

2:45 P.M. *Experimental Analysis of Conceptual Thinking in Brain-injured Children.* HEINZ WERNER and ALFRED A. STRAUSS, Wayne County Training School, Northville, Michigan.

In previous studies the authors have presented experimental evidence that brain-injured children who are mentally impaired in consequence of an early acquired brain damage differ from normal as well as from children of ordinary (familial) feeble-mindedness in certain sensorimotor and perceptual tests.

The present paper is concerned with the behavior of the same three groups of children in situations which involve the grasp of conceptual relationships. Four tests have been devised. Test I deals with the grouping of simple objects. Test II is a multiple choice test in which material similar to that of Test I is used. The results of these tests demonstrate that the brain-injured children are easily distracted by less essential elements of the situation, elements which, in consequence of their vividness, intensity, extensity, etc., attract the attention so exclusively that most obvious or natural relationships may be overlooked. In Test III the child has to select and place small objects in front of two pictures representing common life situations. Test IV consists of a series of pictures which represent situations in a temporal order and which the child is asked to complete. The results of Tests III and IV demonstrate that brain-injured children, in contradistinction to normal and subnormal children without brain-injury, show an abnormal tendency to be distracted from the main idea of the task; they may suddenly become attracted by a detail of the situation which they work out as a relatively independent unit. Objects selected deviate frequently from their standard meaning, depending on the present trend of thought of the brain-injured child. These and other differences appear to be statistically significant. [15 min., slides.]

3:05 P.M. *A Study of Spontaneous Artistic Productions by the Insane.* ANNE ANASTASI, Queens College, and JOHN P. FOLEY, JR., George Washington University.

The present study is part of a project on the artistic behavior of the insane conducted by the writers over a period of three years under the auspices of the Columbia University Council for Research in the Social Sciences. The data which form the basis for the present part of the project consisted of unselected spontaneous drawings (and a few other products) by 207 patients in 62 mental hospitals distributed over 30 states. A total of 1185 products by 185 patients were examined directly by the writers, the products by the remaining 22 cases being studied through detailed questionnaires filled out for each case. The patients included in the survey were of both sexes and represented a very wide sampling of clinical syndrome, age, educational and occupational level, artistic training, and geographical distribution. The drawings were obtained by circulating an inquiry among all mental hospitals throughout the country exclusive of private hospitals. Individual data from each patient's case history were also obtained on a specially prepared data sheet.

The products were analyzed in reference to: (1) medium, (2) subject matter, (3) technique and execution, (4) color and brightness, and (5) special characteristics, such as inclusion of writing in the drawing, gross distortion of forms portrayed, excessive emphasis upon some single theme, and other peculiarities. The present paper summarizes the major trends revealed by this analysis. [15 min.]

3:25 P.M. *Some Quantitative Properties of Anxiety.* B. F. SKINNER,
University of Minnesota.

The reduction in the rate at which rats pressed a lever under periodic reinforcement was used to measure the presence and magnitude of a state of "anxiety." The anxiety was aroused by a sustained tone which was characteristically presented for five minutes before being terminated by an electric shock. Neither the tone nor the shock had any original effect upon the rate, but after a few combined presentations the tone acquired the power to depress the rate. The terminating shock also came to disturb the rate considerably. After thorough conditioning, the depression produced by anxiety was characteristically followed by a compensatory increase in rate. During subsequent extinction of the response to the lever, the tone depressed the rate to the same extent, and the terminating shock was again followed by a compensatory increase, so that the height of the curve was not altered. During periodic reinforcement the anxiety was extinguished by presenting the tone continuously without shock. The rate returned to normal shortly after the usual time of administration of shock even though the tone continued to sound. Spontaneous recovery from this extinction was nearly complete on the following day, as indicated by the retained power of the tone to depress the rate.

W. K. Estes collaborated in the design and conduct of the experiments. [15 min., slides.]

ATTITUDE AND MORALE

Wednesday, September 3, 1:15 P.M.

Room 100, Speech Building

FLOYD H. ALLPORT, Chairman

1:15 P.M. *Individuals' Estimates of Group Attitudes.* RICHARD WALLEN,
University of Cincinnati.

The purposes of this study were to discover how accurately persons who lived in close daily contact with one another could estimate the attitudes of their group and to find whether or not subjects tended to project their own attitudes into the group. Eight-five per cent (237) of the students in a small residential college estimated the percentage of students in the college who held certain opinions on each of three current issues (war entry, draft, St. Lawrence Seaway). In addition they stated their own views. Data show that a significant proportion of the subjects overestimated in the direction of their own opinions. The error in one estimate was not closely associated with the error in another. Despite

the unusually close daily contact of these subjects, a wide range of estimates was found. [10 min.]

1:30 P.M. *The Effect of the Social Status, or Membership Character, of the Interviewer Upon His Findings.* DANIEL KATZ, Princeton University.

The customary procedure in public opinion polls and in social research in general is to select interviewers from a narrow region of the total socioeconomic range—namely, from white-collar groups of at least average-plus income and with some college training. The purpose of the present study, conducted by the Princeton Public Opinion Project, was to compare the findings of typical white-collar interviewers with those of working-class interviewers. The white-collar group consisted of five Gallup interviewers and four new men eligible for the interviewing staff of the American Institute of Public Opinion. The working-class interviewers comprised 10 semiskilled workers and mill hands, trained briefly in the methods of the American Institute. Both groups of interviewers were sent into comparable poor-rental areas of Pittsburgh with the same instructions and the same questionnaire ballot.

The returns from 600 respondents interviewed by the white-collar staff showed significant differences on most of the questions from the answers of the 600 respondents interviewed by the working-class staff. The differences were greatest on questions relating to labor issues and were further magnified when only respondents who belonged to labor unions were considered. These differences are due both to the tendency of the interviewer to select his respondents on other than a random basis and to the tendency of the respondent to be affected by the social status of his questioner. The results indicate that in many types of social research, where the interviewer is the all-important measuring stick, his social status or group membership is an important variable which in itself must be controlled. [15 min.]

1:50 P.M. *Two Studies of the Effects of High School Teachers' Social Attitudes Upon the Attitudes of Their Pupils.* HARRY M. MASON, Bureau of Agricultural Economics, Department of Agriculture.

In two experiments, teachers of high school social science classes were tested with a scale designed to measure social liberalism—conservatism. Pupils of these teachers were measured with the same attitude scale at the beginning and end of a semester's work. Shifts in mean attitude score were compared in groups taught by liberal, moderate, and conservative teachers.

Subjects in the first experiment were teachers and pupils in a Midwest metropolitan high school. In addition to shifts in pupils' attitudes associated with liberalism of the teacher, this experiment showed relationships between pupils' intelligence scores, subject preferences, activity records, and economic status, on the one hand, and their social attitudes, on the other.

Teachers and pupils in Midwest rural high schools were subjects in the second experiment. This study involved use of current affairs information tests as well as attitude scales. Class mean shifts in attitude during the semester were shown to be related to teachers' attitudes. Moreover, a teacher's attitude score was a better predictor of her pupils' information gains during the semester than was her own information score. Differences between pupil-group means associated with interests, home background, and community were also found.

The first experiment was carried on during the school year of 1938-1939, the second during the school year of 1939-1940. Fifty-three teachers and some 1200 pupils participated in the two studies. A grant from the Purdue Research Foundation supported the work. Mr. Nathaniel Lees Gage, of Purdue University, assisted in the analysis of the data. [15 min., slides.]

2:10 P.M. *A Comparison of the Public Attitudes of 711 Eminent Business Executives With Those of 65 Distinguished "Progressive" Educators.*
GEORGE W. HARTMANN, Teachers College, Columbia University.

This study is an outgrowth of the "lay conferences" held at Teachers College, Columbia University, since 1935 for the purpose of acquainting prominent businessmen and educators with their often-conflicting views on various social issues. The likenesses and differences between these two groups were of sufficient interest to both to enlist their joint support in an effort to determine their respective attitude patterns. A committee of distinguished industrialists aided the investigator in selecting and framing 66 statements included in the final opinionaire. The selection of respondents for this *national* survey was made from three sources: (1) a thousand names of their members, chosen alphabetically at random but with due regard to geographical representation, supplied by the National Association of Manufacturers; (2) Polk's *Purple Directory* of bankers, including financial investment houses; and (3) the *Directory of Directors*. In (2) all bankers listed as officers of national, regional, and specialized professional organizations were included; in (3) the top right-hand name on each page of the directory was listed. A total of 1974 blanks with a covering letter from a sponsoring body were distributed late in February, 1939; 711, or 36%, were returned for analysis. The nearest comparable group in the educational world were the 66 fellows of the John Dewey Society for the Study of Education and Culture, most of whom were also directors of the *Social Frontier*, then edited by the investigator; 65, or all but one, of these distinguished educators replied. A mean "liberalism" index of 19.69 for the businessmen contrasted with a similar figure of 53.62 for the educators, indicating that the two highly selected populations were attitudinally distinct, since 100% of the educators exceeded the average of the executives. This general divergence, however, was compatible with some striking cases of agreement concerning the preferred solution to specific social, political, economic, and educational problems. Significant similarities and contrasts are documented in detail. [15 min.]

- 2:30 P.M. *Conformity Behavior of Labor Newspapers With Respect to the A.F. of L.-C.I.O. Conflict.* STEUART HENDERSON BRITT, George Washington University.

This study, carried out with Royce L. Lowry, was concerned with whether or not the conformity of labor newspapers corresponds to a J-curve with respect to the conflict between the American Federation of Labor and the Congress of Industrial Organizations. An analysis of 1329 issues of 177 labor newspapers was made for a period of three months in terms of four steps on a telic continuum: (1) use of materials from the national organization, plus local comment derogatory of the rival organization, its leaders, or both; (2) use of materials from the national organization, with no comment; (3) strict neutrality; (4) recommendations of cooperation between the two groups.

Comparisons were also made between: local labor papers and those published by national unions; papers of A.F. of L. affiliates and of C.I.O. affiliates; papers of A.F. of L. nationals and of C.I.O. nationals; papers of A.F. of L. locals and of C.I.O. locals; papers of C.I.O. nationals and of C.I.O. locals; papers of A.F. of L. nationals and A.F. of L. locals; and papers of local labor organization in a "nonconflict" situation and those in a "conflict" situation.

Position 3 was the mode in practically all cases, and no J-curves were found in any of the groups studied. This means that there were no curves of institutional conformity to the philosophy of the national groups. The J-curve analysis was valuable in showing that the division between the two national labor organizations is not explainable simply as an *institutional* conflict between industrial unionism and craft unionism, or as a case of "power politics." [15 min., slides.]

- 2:50 P.M. *World Crisis and the Changing Policies of Peace and Patriotic Societies.* RALPH H. GUNDLACH, University of Washington.

Two years ago an analysis of the programs of peace and patriotic societies showed that despite their huge membership their proposals were not reflected in governmental policies. A psychological explanation was offered.

A second study is now reported, in view of the new world scene. The societies were asked specifically about their position on national defense regarding armaments, profits, conscription, labor, and civil rights; about foreign policies with regard to Britain, China, Japan, the Soviets, South America, and world empire; and about the chances that victory will bring a world order of peace and freedom.

Major interests are the changes in membership, the shifts in policies, and the relations of the policies and action of each society to the actions of the individual members and to governmental policy. [15 min.]

- 3:10 P.M. *Some Factors Related to Morale in a Period of Stress.* GOODWIN WATSON, Teachers College, Columbia University.

Indices of personal morale were developed from items in Bernreuter, Strong, and Hall inventories and applied to records of 600 clients of the

Adjustment Service who, in 1934, had faced unemployment for periods ranging from a few months to more than four years. Preliminary analysis showed little relationship of morale scores to age, intelligence, vocabulary, mechanical skill, art judgment, being native born, period of unemployment, avocational interests, or radicalism. High morale was more common among married men with dependents, church members, with a record of stable employment at jobs above the unskilled level, high previous earnings, higher education, election to club offices, free from physical or personality handicaps, dominant, self-sufficient, with occupational interests in the direction of social service or commercial work. The results suggest criticism of some types of effort designed to strengthen national morale. [15 min., slides.]

3:30 P.M. *Four Techniques for the Study of Morale.* EUGENE L. HOROWITZ, College of the City of New York.

A series of four devices have been developed, each of which may be useful in research on problems of morale. The first test is a measure of generalized satisfaction-dissatisfaction with various aspects of American culture; the second test is one involving story completion scored for "happiness"; the third is a test of picture completions; the fourth, an association test.

These four tests have been used in studies of college students (not all in the same studies), and preliminary results are available. Test reliabilities will be reported together with the results relevant to autistic functions. [10 min.]

3:45 P.M. *Favorable vs. Unfavorable Propaganda in Music.* MELVIN G. RIGG, Oklahoma A. & M. College.

The data were secured from 457 college students, who indicated how well they liked phonograph recordings under various conditions. Merely repeating music without comment produced a gain in appreciation. Any comment, even something unfavorable, also seemed to increase appreciation by making the piece more interesting. An appreciable difference on second hearing was secured between one group in which Wagner's music was presented in a romantic light and another in which it was characterized as expressing the brutality of the Nazi philosophy and as being the favorite music of Hitler. But this unfavorable propaganda was not quite enough to counterbalance the gain coming from a second hearing without comment. Music students were less influenced by propaganda than were other students. [10 min.]

PERSONNEL

Wednesday, September 3, 1:15 P.M.

Room 104, University Hall

MORRIS S. VITELES, Chairman

1:15 P.M. *A Psychological Classification of Occupations.* STANLEY G. DULSKY, Rochester Guidance Center.

Classifications of occupations taken from census reports or based on economic theory have no practical value for vocational counseling. Therefore, a psychological classification is presented based on behavior representing primarily (1) intellectual activity (work with ideas), (2) physical activity (work with things), and (3) social activity (work with people). Most occupations combine any two of these activities in different degrees.

These three primary activities are represented diagrammatically on a triangle, each located at an angle point. Occupations are listed on each of the three sides of the triangle closer to the point representing the more important of the two activities. A number of specific occupations are so located.

It is indicated how this schematization facilitates the process of correlating the analysis of the individual (in terms of intelligence, personality, and interests) with a vocation or vocational area which, because of its classification, has already been subjected to psychological analysis. [10 min.]

1:30 P.M. *The Concept of Occupational Adjustment.* WALTER A. LURIE, Jewish Vocational Service, Chicago, Illinois.

The need for criteria of occupational adjustment arose from the attempt to validate vocational guidance programs through follow-up studies. A variety of criteria have been proposed, including various measures of earnings, time employed, changes of employer, job interest and satisfaction, and others. No one of these and no weighted combinations have proved altogether satisfactory. Viteles has proposed a clinical measure, the "dynamic criterion," based upon a judgment of the person's achievement in relation to his potentialities.

It is suggested that the concept of occupational adjustment as a psychological entity is untenable. Analytical methods can be expected to define several dimensions of occupational adjustment which must be observed separately and which can be distinguished as goals of vocational guidance programs.

Two sets of data are presented. The intercorrelations of five criteria in Thorndike's major study of vocational success showed tetrad differences significantly greater than zero. Data on the work adjustment of JVS clients exhibited a polydimensional structure with no common factor which could be designated as "occupational adjustment."

Subsequent studies of data specifically gathered for the purpose will

be necessary to identify the factors of occupational adjustment. It is clear, however, that the concept must be broadened and that no single criterion can ever be entirely adequate. [15 min.]

1:50 P.M. *A Study of Executive Ability.* L. J. O'ROURKE, U. S. Civil Service Commission.

The preliminary program will include determination of important, ratable factors conditioning success or failure as executives, measurement of factors most difficult to influence, and a supervisory program to counteract weaknesses and strengthen favorable factors.

The first point will be carried on by having officials evaluate junior executives as to reasons for (1) promotion, (2) dismissal, (3) unchanged status over 10-year period, and as to how high they are potentially qualified to rise in 10 years, indicating factors favoring and limiting advancement, using a guide chart. The important factors upon which there is agreement will be studied and, separately, those upon which there are conflicting judgments.

The study will be used to show management: (a) how well policies and objectives of management are explained and understood, (b) how well information about company is known, (c) how lack of understanding and appreciation of company's personnel programs may cause low morale, (d) how to improve supervision, and (e) how management groups can make more uniform appraisal of junior executives. [10 min.]

2:05 P.M. *An Applied Psychological Study of the Self-Evaluation of American Scientists and Specialized Workers.* LEONARD CARMICHAEL, President of Tufts College and Director of the National Roster of Scientific and Specialized Personnel.

The technique of questionnaire and technical check-list construction, coding of information, and punch-card utilization of the National Roster of Scientific and Specialized Personnel is described as a tool making possible an evaluation of the individual differences existing between scientific and other professional workers in America as determined by each individual's own report of facts concerning himself. The advantages and disadvantages of this technique as contrasted with other procedures in determining facts concerning the psychology of individual differences are presented. Typical "cleavage planes" in data are described in relation to the dimensions of the "professional personality" which, when reduced to numerical form, seem most significant in sorting out individuals to perform specialized occupational and consulting tasks. Based upon information secured by distributing more than 250,000 questionnaires, data are presented in the paper concerning the response to the questionnaire by individuals in approximately 50 professional groups which have varying educational and occupational standards. Sex, age distribution, educational level, and other data as functions of professional association are given. The paper briefly touches upon the use of the Roster in applied personnel and placement procedures and in educational and social planning. For comparative purposes some reference is also made to similar lists in other nations. [15 min., slides.]

2:25 P.M. *Improvement of Employee Selection by Dual Weighting of Test Items.* CARL IVER HOVLAND, Yale University.

In personality and interest tests for employee selection, weighting is customarily based on the discrimination which an item affords between applicants in general and those who subsequently succeed, or between those who succeed and those who fail. These procedures rest upon the assumption that successes differ from failures in the same direction as successes differ from applicants. Analysis of responses on a test of over 500 items administered to groups of several thousand industrial applicants, whose subsequent industrial histories were available, indicated that this assumption is not always valid; in many instances successes differ from failures in a direction opposite to that in which they differ from applicants as a whole. For example, successes were more aggressive than applicants, but less so than failures. Here weighting items on the basis of differences between successes and failures would result in reversed scoring; weighting on the basis of differences between successes and applicants would make such items nondiscriminating.

To obviate these difficulties a new approach was tried, using applicants as the reference point and predicting separately success and failure, on the assumption that the best risks would be individuals whose scores indicated a high probability of success, a low probability of failure.

Two sets of weights were calculated for the discriminating items, the first based on the difference between applicants in general and those who succeeded, the second based on the difference between applicants and those who failed. Two critical scores were then established; on the "success" scale the individual had to surpass a given critical score, but on the "failure" scale had to score below the critical point. The improvement in prediction of industrial success resulting from this procedure will be demonstrated by the results of several experiments. [15 min.]

AUDITION

Wednesday, September 3, 1:15 P.M.

Music Hall Assembly Room

ARTHUR G. BILLS, Chairman

1:15 P.M. *A Study of Auditory "Brightness."* ROBERT WARD BURNHAM, Rutgers University.

Certain of Hornbostel's experiments indicated that the attribute of brightness was an intermodal property, that particular visual, auditory, and olfactory stimuli could be said to have the same "brightness." Cohen attempted to verify Hornbostel's work but found, by shifting the range of stimuli to be correlated for "brightness," that a stimulus could always be chosen by his subjects from each range as equivalent in "brightness" to the original stimulus presented. There was, then, a stimulus in each arbitrarily chosen range of stimuli within a single sensory

dimension which could be said to be equivalent in "brightness" to any given heteromodal stimulus.

The present experiments extended Cohen's results to two sensory dimensions and demonstrated that 24 subjects correlated both visual hue and visual brightness with pitch in audition. It must, therefore, be concluded that subjects are merely choosing a member of each visual dimension which has, in its own dimension, the same relative position as has the "correlated" pitch in its dimension. [10 min., slides.]

1:30 P.M. *The Significance of Audible Onset as a Cue for Sound Localization.* DAVID P. BODER, Illinois Institute of Technology.

Recent investigators have observed that intermittent sounds are more readily localized than continuous sounds. The present investigation finds that at least two categories of *continuous* sounds should be distinguished: (1) the "*continuous-discrete*" tone, which starts under conditions of relative silence; and (2) the "*continuous-interlocking*" tone, which follows immediately after, or even briefly overlaps, its predecessor. A quantitative study indicates that the three conditions may be reliably classified, from the least to the greatest difficulty of lateral localization, in the following order: intermittent, "*continuous-discrete*," and "*continuous-interlocking*." A hypothetical interpretation of the results in terms of Culler's findings concerning the "*on-off*" response of the cortex to tones is proposed. Messrs. Irving Goldman and John O'Malley, students of the Institute, have coöperated in the experiment. [10 min.]

1:45 P.M. *A Study of Absolute Pitch.* C. H. WEDELL, Princeton University.

This study was made by Mr. B. L. Riker, of Princeton, under the supervision of the author. The problem was to determine the accuracy of the absolute judgment of pitch and to discover whether absolute pitch ability varies only quantitatively or whether there are distinct types.

The test consisted of judging the pitch of each of a series of 24 tones covering the whole range of the piano. Two instruments were used to generate the tones, the piano and a vacuum-tube oscillator. The electrically produced tones contained 1% or less of harmonics.

Four groups of subjects were used. One group of 9 were sure they had absolute pitch. A second group of 11 musicians were doubtful whether they possessed it. Also, two control groups were obtained. The first group of 17 subjects judged the piano tones, and the second group of 100 judged the pure tones.

The interpretation of the results from the piano test depends upon the measure of ability one prefers to use. In terms of the per cent of correct judgments (excluding octave errors) there is a practically continuous distribution from one subject who made no errors to some who made no correct judgments. However, if average semitone error is the criterion, the curve is bimodal with one mode at .5 semitones and one at 4 semitones. The tests with pure tones give the same results except that only two subjects did as well on the pure tones as on the piano tones.

Previous work in the field is compared with the above results, and such factors as the effect of practice and training are discussed. Also, other quantitative comparisons of the performance of the four groups of subjects are made and interpreted. [15 min., slides.]

2:05 P.M. *The Quality of a Musical Tone.* CARL E. SEASHORE, State University of Iowa.

The report covers the experimental procedures in the determination of the quality of a tone. Tone quality is shown to have two components, timbre and sonance. Each of these is illustrated and defined. The definition of tone quality is derived from the combination of these two factors. Illustrations will reveal the internal structure of a good musical tone. [15 min.]

2:25 P.M. *Diplacusis in "Normal" Ears.* S. S. STEVENS and J. P. EGAN, Harvard University.

Symptomatic of certain aural diseases is the patient's report that the quality of hearing is different in the two ears. *Diplacusis binauralis dysharmonica* denotes the kind of "double hearing" in which a tone produces in each ear a different pitch. Although it is only in "defective" ears that we find dramatic differences in pitch, precise measurement discloses that a single frequency may sound different in pitch to ears checked as "normal" by standard audiometric methods.

Apparatus: Two oscillators, two attenuators, and two moving-coil receivers supplied separate tones to each ear. Each tone could be heard by the observer whenever he pressed one of a pair of keys. His task was to listen alternately to each tone and to adjust the frequency of the tone heard with one ear until it matched in pitch the tone heard with the other. The two tones were of the same intensity.

Results: Of seven people tested, none was found to be entirely free of diplacusis. At some frequencies their ears were matched with respect to pitch, but for other tones the frequency in one ear had to be changed by as much as 2.5% (roughly 10 j.n.d.'s) in order to produce equality. Of especial interest is the finding that, whereas at one frequency the right ear heard the tone as higher in pitch, at a slightly different frequency the situation was reversed, and the pitch was higher to the left ear. The course of these reversals was mapped out by systematic measurements.

The relation of diplacusis to frequency was different in every pair of ears. In general, however, the amount of diplacusis was less at high than at low intensities. [15 min., slides.]

2:45 P.M. *The Nature of Cochlear Activity After Death.* ERNEST GLEN WEVER, CHARLES W. BRAY, and MERLE LAWRENCE, Princeton University.

The electrical potentials arising in the cochlea in response to sound stimulation persist for a number of hours after the death of the animal. The present report is concerned with the quantitative aspects of the deterioration of the response upon death.

At about the moment of death, as judged by cessation of the heart beat, the cochlear responses drop abruptly in magnitude. This initial phase of the death process is followed by a long, slow decline. The initial drop is a result, in part, of anoxemia, but changes in fluid pressure probably also play a part in determining the magnitude of the drop, since this varies with the manner of production of death. Blood pressure, however, is not directly related to the initial fall.

The slow deterioration of response which follows the initial drop proceeds at a rate which differs for different frequencies of the sound stimulation but is independent of sound intensity, at least within the limits of weak and moderately intense stimuli. The slow deterioration is probably related to changes in body temperature. Typically, the course of the slow deterioration is interrupted by slight, partial recoveries which will be discussed.

The results indicate that in death the cellular changes are simple and that the cochlear potentials arise through a direct translation of stimulus energy rather than through a liberation of stored energy. [15 min., slides.]

3:05 P.M. *Cerebral Subordinate Localization in Auditory Function.*
L. A. PENNINGTON, University of Illinois.

The aim of this study has been to determine to what extent functional and anatomic subordinate localization within the auditory areas of the albino rat's cerebral hemispheres exists. The methods follow. The animals were given preliminary training in escaping electric shock by jumping from one platform to another in response to a buzz. Next, each animal was trained consecutively to escape the application of the current by responding to the frequencies 2048, 2896, and 4096 at 75-decibel value. These stimuli were generated by the Maico D-5 Audiometer. Cerebral operations were restricted to focal lesions within the auditory regions. Postoperative tests duplicated the original training procedures. Under the conditions of this study the data indicate for the rat little, if any, evidence for specific functional-anatomic subordinate areas within the cerebral hemispheres for the three frequencies studied. [10 min., slides.]

RESEARCH AND INSTRUCTIONAL FILMS

Wednesday, September 3, 8:15 P.M.

Cahn Auditorium

LOUIE WINFIELD WEBB, Chairman

Note: The showing of films will not be accompanied by verbal descriptions, since proper titles in the films will be adequate.

The Effect of Temperature on Memory in Goldfish. JOHN W. FRENCH, Princeton University. [10 min.]

Neural Maturation as Exemplified in the Reaching-Prehensile Behavior of

the Human Infant. MYRTLE B. MCGRAW, Columbia University. [12 min.]

Neural Maturation as Exemplified in the Changing-Reaction of the Infant to Pin Prick. MYRTLE B. MCGRAW, Columbia University. [12 min.]

Experiments on Behavior and Its Relation to Physical Form. WILLIAM T. JAMES, Cornell University. [15 min.]

Abortive Behavior as an Alternative for the "Neurotic" Attack in the Rat. NORMAN R. F. MAIER, University of Michigan. [12 min.]

Metrazol-induced Convulsions in Normal and "Neurotic" Rats. NORMAN R. F. MAIER and J. SACKS, University of Michigan. [12 min.]

Emotionality, Activity, Curiosity, and Persistence in the Rat. F. BILLINGSLEA, Western Reserve University. [12 min.]

Transferred and Substitute Conditioned Responses Localize Specific Motor Learning in the Cortex of the Dog. P. S. SHURRAGER and H. C. SHURRAGER, University of Pennsylvania. [15 min.]

Responses by Monkeys to Stimuli Having Multiple Sign Values. H. F. HARLOW, University of Wisconsin. [20 min.]

Color-Categorizing Behavior by Monkeys. BENJAMIN WEINSTEIN, University of Wisconsin. [15 min.]

Hypnotic Induction of Color-Vision Anomalies. PHILIP L. HARRIMAN, Bucknell University. [20 min.]

Techniques of Anthropometric Measurements in Young Children. NANCY BAYLEY, University of California. [15 min.]

Experiments on "Facial Vision." KARL M. DALLENBACH, Cornell University. [20 min.]

EDUCATIONAL

Program Arranged in Collaboration With the American Association for Applied Psychology

Thursday, September 4, 9:00 A.M.

Room 100, Speech Building

EDGAR A. DOLL, Chairman

9:00 A.M. *Student Evaluation of Knowledge of College Aptitude Test Score.* R. K. COMPTON, South Dakota State College.

An opiniaire was administered by personnel officers in 27 colleges to 1331 students who had been informed of their percentile score on the A. C. E. Test. The student reported whether his score was lower, higher, or about what he expected; the effect of knowing his score on scholarship aim, scholarship achievement, self-regard, emotionality, course of study, vocational choice; and whether the general effect was beneficial, detrimental, of little significance, or of uncertain value. An analysis of the

responses is made for the whole group and for three controls: relation of score to self-estimated ability, the level of ability in quintiles, and four defined amounts of counseling. Percentages indicated that many students consider themselves benefited and few negatively influenced. Coefficients of contingency and the Chi-square test show significant relationships between the attributes and the three controls. [10 min.]

9:15 A.M. *Factors Bearing on Academic Achievement Among Institutionalized Mentally Deficient Children of Moron and Borderline Level.* RUTH T. MELCHER, Wayne County Training School, Northville, Michigan.

The problem is to discover what are the means for progress in academic achievement between 12 and 16 years of age of children, with IQ's from 50 to approximately 80, who have been institutionalized because of failure in the public schools, and to define factors which militate toward departure from these means. With the collaboration of Miss Charlotte Philleo, interne, 548 cases (314 boys and 234 girls), who had been in the Wayne County Training School at least one year prior to their sixteenth birthday, were selected from the institution files. Their records were analyzed for rate of progress and the relation of academic achievement to the following factors: (1) sex, (2) white or colored race, (3) age and IQ at institution entrance, (4) mental age and IQ at the time of the achievement test, (5) relative achievement in reading, arithmetic, and spelling, (6) incidence of special disabilities, (7) etiology of the mental deficiency. Findings indicate that, regardless of age of institutionalization, children with IQ's from 50 to 70 tend to complete the third grade by 15 years of age; those with IQ's 70 to 80 tend to complete the fourth grade. Little progress occurs, on the average, between the fifteenth and sixteenth years. Special disabilities (indicated by a discrepancy of two or more years between Binet mental age and test age of the ability in question) occur at some time in the test history of approximately 38% of the white boys and 44% of the colored boys, but in only 13% of the white girls and 20% of the colored girls. These discrepancies are often overcome by the end of the school period without special remedial help. The effect of special groups upon the means for the total group will be discussed. [15 min., slides.]

9:35 A.M. *Psychopathological Causes of Inefficiency in Our Colleges.* JAMES L. GRAHAM, Lehigh University.

Much of our accumulated knowledge of inadequate individuals, with their basic defects, abnormal motivations, and readjustments, is related to appraisals of psychopathological types, mechanisms, and evoking situations. The shock of the present world crisis suggests the extension of this idea of maladies to our institutions and culture. With this analogy to guide our seeing, the schizoid and dementia praecox pattern seems to be an apt and useful classification for understanding many of the inadequate ways of our colleges and for formulating remedies to increase their effectiveness.

Attempts will be made to show that many familiar and widely conditioned habits of our schools fit logically in the psychopathological pattern of evasion of responsibilities. Also, many nonadaptive habits of our colleges are analogous to the ways in which schizophrenics make their withdrawing formula self-acceptable and tolerable. Examples will be presented that fit such classifications as: reduction of desires by oversimplifying problems, environments, and tasks; refusing to grow up—that is, the fixation and regression mechanisms; preoccupation with relatively indirect and useless aims and verbal and ceremonial activities which sustain flight from realities; and the cultivation of poses of incapacity and playfulness which support irresponsibility. While the remedy for any pathological condition is primarily to eliminate or reduce it, the analogy offers important secondary suggestions for rebuilding an adequate defense against gross maladjustment.

It is not implied that our colleges are more ill or socially intolerable than our other important institutions, but rather that their health is most important. It is not assumed that their capacities and mental functioning are impaired or that their administrators are mentally ill. It is merely assumed that their energies are often directed away from making needful and wise adjustments. [15 min.]

9:55 A.M. *Primary Mental Abilities and Scholastic Success in the Divisional Studies at the University of Chicago.* K. S. YUM, University of Chicago.

With Professor Thurstone's isolation of seven primary abilities, use of the profile of abilities in place of a single composite index of intelligence for an individual presents some definite advantages hitherto inaccessible, yet highly important for educational and vocational guidance. The present investigation is concerned with (1) the average profiles of primary abilities and the divisional studies in the physical, biological, and social sciences; (2) their sex differences; and finally, (3) the relation between the primary abilities and scholastic success, in college. The Experimental Edition of the Tests for Primary Mental Abilities was given to 110 students, each student in three sessions of less than two hours each. These students were mostly juniors and a few seniors. Scholastic success was measured in terms of averaged grade points from the courses taken at Chicago.

The results seem to point to some new and quite significant perspective in the field of guidance. The mean profile of the college students has the highest rating on the verbal factor. The next highest are the deductive reasoning and the perceptual factors. The largest correlations for the total group are from the verbal and inductive reasoning factors on the averaged grade points. The evidences also seem to be quite indicative of sex differences and differences in the divisional studies, both in the mean profiles of abilities and in the correlations between the abilities and averaged grade points, of the groups studied. Finally, the ambiguities arising from the use of a single composite index of intelligence are demonstrated. [15 min., slides.]

10:15 A.M. *Differential Prediction of College Achievement in the College of Letters and Science at the University of Wisconsin.* C. H. RUEDISILI, University of Wisconsin.

The basic motive underlying the present investigation has been to determine the validity of certain objective indices of ability, available at this University, for predicting success in six different college subject fields.

The subjects used were all Letters and Science graduates of the classes of 1935 and 1936 for whom there were complete records; these totaled 415 students, all of whom had taken all of their college work at Wisconsin and had graduated in four years.

Four variables were collated for each subject: (1) four-year college grade-point average in each of these six subject fields: English, foreign language, mathematics, natural sciences, history, and social sciences; (2) four-year high school average grade in each of the same six subjects; (3) percentile ranks on the American Council Psychological Examination, including a total score and, also, those for the subtests: completion, artificial language, analogies, arithmetic, and opposites; and (4) high school percentile rank. After these data were punched on Hollerith cards, the means, standard deviations, and zero-order correlations were calculated for each of the 19 variables when paired with every other one. From these 276 correlations, the multiple correlation coefficients were computed for each of the six college subject fields using those combinations of the predictive items which gave the most promise.

Analysis of the zero-order relationships shows that both the high school grades and the subtests of the American Council are of practical value for differential predictive purposes. Some of the multiple R 's found for the specific college subjects are as high as those usually obtained in the prediction of general college achievement. Foreign language gives the highest (.719), followed by English (.641), mathematics (.530), social science (.525), history (.460), and natural science (.426). [15 min.]

10:35 A.M. *A Socialized Service-Laboratory Program in Educational Psychology.* S. L. PRESSEY, Ohio State University.

The paper is a summary of a largely new program in educational psychology.

A room is devoted entirely to the course (about a thousand students a year, in sections of about 30); the walls are covered with relevant charts and pictures, and there are cabinets and exhibit cases. Also, sections of the elementary course are continued, with the same instructor, into educational psychology, so that students and instructors have two sequential courses in which to become acquainted.

The program in educational psychology involves the following special features: (a) The laboratory work is of a practically useful service nature, as making school surveys. (b) The program is socialized; the students work together, go on professional trips together, have occasional social affairs. (c) Instructors have an opportunity to see these students under various circumstances, and obtain varied data about them, including evaluation by other students. The course thus yields remarkably rich

personnel information about each student. (d) The program is staffed primarily by graduate students working for their doctorates, and their thesis projects are often related to this program. It is thus an integral part of a graduate program for training college teachers.

The paper will not only describe the program, but will report first evaluations of its special features. [15 min.]

10:55 A.M. *Some Effects of 10 Years of Psychological Service in a Public School System.* WALTER L. WILKINS, Shorewood Public Schools, Milwaukee.

In a school system in a residential suburb with full-time psychological service (a psychologist for each 50 teachers), where the major emphasis has been on effective mental hygiene, with treatment not through the psychologist, but through the teaching staff and through parent contacts, certain changes in teacher attitudes toward children's problems might be expected. Teachers' attitudes toward standard tests and testing procedures and teachers' reactions on a previously standardized test of knowledges of mental hygiene situations and principles are reported. The relative roles of the teacher and the school psychologist in diagnosis and in treatment of school children's problems, especially on the secondary school level, are considered. [10 min.]

11:10 A.M. *The Stability of Measured Interests of Adolescent Girls Over a Two-Year Period.* LEONA E. TYLER, University of Oregon.

The problem was to ascertain whether measured interests are constant enough to have any value in the guidance of adolescents. In the course of a larger research project using the Minnesota Interest Test, which has two scoring keys for measuring the amount of resemblance a girl shows to College Preparatory and Commercial students in high school, 81 girls tested in eighth grade in 1939 were retested in 1941. Correlations were .61 for the College Preparatory scale and .54 for the Commercial scale. More constancy is indicated when the letter grades of persons originally making an A score on one of the scales are considered. Of this group of 48, 83% in 1941 still have scores in the same letter classification. The 1941 distribution is significantly more variable than the 1939 one. [10 min.]

11:25 A.M. *A Study of the Influence of Philosophical Attitudes on Personality Adjustment.* ERNEST M. LIGON, Union College.

Studies of environmental forces, of the efficiency of the sense organs, of the endocrine glands, of the emotions, and of external motivations upon personality are numerous. The philosophical attitudes—that is, one's system of values, moral concepts, and universal attitudes, which constitute his effective religion—have largely been neglected by scientific psychology. In the Union-Westminster Character Research Project, some 300 children are studied experimentally each year. This includes a very extensive battery of standardized tests and measurements. Most of the children have been observed over a period of six years. While some changes have been made in their environmental influences, a large ma-

jority of the efforts to guide their development have consisted in forming or changing their philosophical attitudes. Such persistent and widespread attitudes as fear of failure, sensitiveness to criticism, lack of enthusiasm, negative attitudes toward basic moral codes, and lack of purposiveness have been attacked by systematic educational techniques. Some of the results, especially in individual cases, have been impressive in their effectiveness. The methods developed for forming and changing these attitudes demand far greater psychological insight than has been typical of most character education. The application of this approach to character education has involved a utilization of all of the factors in personality. Discovering the age levels at which various attitudes can best be taught has been a major task in this project. Some of the findings can be reported with confidence. The quantitative measurement of this kind of results, though still not sufficiently refined to warrant general use, is now clear in method and is rapidly being brought to the point of effective application. [15 min., slides.]

PUBLIC OPINION

Program Arranged by the Program Committee of the Society
for the Psychological Study of Social Issues

Thursday, September 4, 9:00 A.M.

Room 107, Harris Hall

DANIEL KATZ, Chairman

9:00 A.M. *Some Techniques for Establishing the Validity of Opinions as Measured by Public Opinion Polls.* HENRY C. LINK, Psychological Corporation.

Reliability and validity have long been fundamental problems in psychology, especially in connection with the use of tests. With respect to reliability, polls have made great progress. However, the validation of the opinions measured by polls, with respect either to behavior or to other criteria, has received comparatively little attention, with the exception of prediction of elections. This is an extension of the situation with respect to attitude scales, where the bulk of the work has been upon the development of the scales rather than upon their validation.

This paper will try to define some problems of validity in the field of public opinion. It will illustrate these problems with techniques developed by the Psychological Corporation for establishing the relationship between opinions and beliefs, on the one hand, and behavior, on the other. Material will be based upon: (a) the Psychological Barometers, or polls of public opinion and various forms of behavior made periodically since 1932 with a total of 51 nation-wide studies of 268,000 personal interviews; (b) specific commercial studies involving not only reliable measures of opinion but an evaluation of opinion in terms of past and future behavior.

The selection of material and techniques will be governed, as far as possible, by their relevance to problems of current importance. Among

these are propaganda and morale, where the relationship between opinions and conduct is of primary importance and where it is desirable not only to conduct polls to discover what people think but to obtain measures of how they will act, or discover what beliefs are most likely to influence their actions.

A. D. Freiberg collaborated in the study. [15 min.]

9:25 A.M. *Characteristics of Opinion Poll Interviewers.* A. B. BLANKENSHIP, N. W. Ayer & Son, and J. L. OTIS, Western Reserve University.

A number of opinion poll interviewers who did intensive interviewing over a period of seven months during the 1940 presidential campaign were given a battery of tests (intelligence, personality, etc.). Personal data were collected for each worker. Test results and personal data were compared with efficiency, as measured by performance in the interviewing. Findings are presented, and implications discussed. [15 min.]

9:50 A.M. *Some New Instruments for Measuring Partisan and Institutional Attitudes in Governance.* HERMAN G. BEYLE, Syracuse University.

Our studies of partisan and institutional attitudes have involved three different developments of instrumentation. The first development follows the lead of the Beyle-Kingsley service rating scale. The scales are built by psychophysical methods and are founded on sharp, graded, and stable institutional understandings. Application has been made to morale, financial status of municipal governments, and evaluation of civil service systems.

A second development has turned upon elaboration of the Likert technique. Thus, scale values have been developed for a battery of multiple choice items dealing with morale. The Likert technique has been adapted to a study of related features of an involved debatable issue and of related features of an institution subject to public criticism.

Finally, a series of scales of general applicability in situations involving debate have been developed. These scales deal with substantive proposals for action, policies in action but still debatable, actions, conditions, persons, groups, candidates, and officers involved in debate. The instruments can be used where single or rival social objects are the focus of debate. They involve specification of the direction of attitude, measurement of degree of favor-disfavor, and statement of features of object favored or disfavored. They are of varying length so as to be applicable to large or select pollings. [15 min.]

10:15 A.M. *An Attempt to Measure the Intensity Dimension of Opinion.* WILLIAM SALSTROM and HADLEY CANTRIL, Princeton Public Opinion Research Project.

Previous attempts to measure the affective dimension of opinion through the use of psychophysical scales, while apparently quite reliable, have been considered too time-consuming both in the formulation of the scales and their application to be of practical use to organizations polling

public opinion on a nation-wide scale. This experiment in measurement was an attempt to develop a short, generalized scale which could be economically administered and be adapted to a variety of questions.

Scale values for a series of generalized intensity statements were determined by having the statements scaled by the rank-order method on a continuum of the "intensity of an opinion." In application, a scale of three statements was applied to opinions representing both sides of a dichotomous question concerning aid to Britain by the United States. Distributions of the sample population on the intensity scale are given, together with their relationships to the opinions of the respondents on other questions related to the war situation. [15 min., slides.]

10:40 A.M. *Recent Trends in American Public Opinion on the War.*
DONALD RUGG, Princeton Public Opinion Research Project.

This paper will present data collected by the Princeton Project, describing trends of opinion on several issues concerned with the war and showing how opinion has been influenced by domestic and foreign political and military events. In addition to this surface story of opinion change, some of the factors underlying different *patterns* of opinions will be discussed. The relation between the desire to help Britain and belief in a British victory will be described, with particular reference to the changes which have taken place in this relationship with the progress of the war. The differing clusters of opinions which characterize isolationists and interventionists and the socioeconomic composition of these two groups will be outlined. The effect on opinion of having men in one's family eligible for military service will be considered. Finally, a general interpretation of the state of opinion on the war will be offered, together with suggestions as to possible future developments. [15 min., slides.]

PHYSIOLOGICAL

Thursday, September 4, 9:00 A.M.

Music Hall Assembly Room

LEONARD CARMICHAEL, Chairman

9:00 A.M. *Influence of an Assigned Hour for Waking on Sleep Motility.*
J. H. ELDER, University of Virginia.

In a preliminary investigation of the alleged ability of certain individuals to awaken at assigned hours during the early morning it was discovered that some subjects showed characteristic changes in activity which appeared to be related to the assigned time for waking or to the actual waking time. Previous investigators have reported, on the basis of verbal statements from their subjects, that attempts to awaken at a predetermined hour produce increased restlessness during these nights.

The present study relies chiefly on objective records of sleep motility obtained with the Johnson kinetograph. Differences in sleeping habits obscure any group tendencies, although individuals exhibit reliable dif-

ferences in motility during control nights and nights when assignments are given. Accuracy of waking at an assigned hour depends greatly on degree of motivation, time of retiring, and temporal relation of assigned hour to usual waking time. [10 min., slides.]

9:15 A.M. *The Effects of Morphine Addiction on the Electrodermal Response to Word Stimuli.* RALPH R. BROWN, U. S. Public Health Service Hospital, Lexington, Kentucky.

A two-year study of the addiction process was made at the U. S. Public Health Service Hospital at Lexington, Kentucky. Data have been gathered concerning biochemical, physiological, electroencephalographic, and psychological changes associated with repeated injections of morphine in two human subjects. Experiments were started in May, 1938, and ended in May, 1940. The present report deals with the electrodermal changes associated with the addiction process. The subjects were two former users of morphine who had been off drugs at least six months prior to the time of the test. Photopolygraphic records were taken of reactions to indifferent and disturbing word stimuli before, during, and following the establishment of addiction. Data are presented on changes in conductance level and the electrodermal response as affected by single injections of morphine, early addiction, late addiction, withdrawal, and recovery. Graphs showing monthly changes are presented. The study revealed the following: (1) Morphine addiction was associated with an increase in the level of skin resistance. (2) Morphine and morphine addiction were associated with a decrease in the electrodermal response amplitude to word stimuli. (3) The electrodermal response difference between indifferent and disturbing word stimuli was reduced by morphine and morphine addiction. (4) Under conditions in which the amount of morphine was increased as addiction progressed, tolerance to the electrodermal effect did not occur. (5) Withdrawal of the drug was associated with a marked increase in the electrodermal response amplitude to word stimuli, especially to words concerned with sex. (6) Recovery from these effects of addiction required six months in one patient who was addicted for a period of seven and one-half months. [15 min., slides.]

9:35 A.M. *Simultaneous Autonomic and Electroencephalographic Changes.* CHESTER W. DARROW, MILTON L. PHILLIPS, and HUDSON JOST, Institute for Juvenile Research, and Department of Physiology, University of Illinois.

A method of graphically analyzing the moment-by-moment changes in the electroencephalographic spectrum is presented. Independent ratings by three raters demonstrate the association of palmar galvanic and blood pressure indications of sympathetic activity with (1) increased beta, (2) decreased alpha, or (3) alpha out of phase in the two hemispheres (increased transcortical alpha). A drop in blood pressure in response to stimulation is shown to be generally associated with increased delta slow wave activity.

A method of measuring alpha, beta, and delta and appropriately combining the values gives curves which in the more favorable (more normal?)

records show considerable parallelism with the autonomic changes. [15 min., slides.]

9:55 A.M. *The Relative Importance of Sensory, Motor, and Central Factors in the Fatigue From Mental Work.* ARTHUR GILBERT BILLS, University of Cincinnati.

The theory that sensory and motor fatigue contribute much of the decrement to mental work was tested by the transfer method. Lucien Cohen tested 120 subjects. In Experiment I, the decrement in speed, accuracy, etc. from 15 minutes of manual color responding, using one eye, was compared with the subsequent recovery when a shift was made to the unused eye. The entire decrement transferred. In Experiment II, the shift was from one hand to the other. Again, the transfer was 100%. But in Experiment III, only 25% of the decrement from responding to color stimuli transferred to colored form stimuli, or vice versa. These experiments show that the decrement was neither sensory nor motor, but specific to the meaningful aspect of the stimuli reacted to. Therefore fatigue is mainly central. [10 min., slides.]

10:10 A.M. *The Stimulation of Nerves by Electrical Fields.* J. A. GENGRELLI, University of California at Los Angeles.

According to the semipermeability theory of nerve functioning, the axon is a Helmholtz cylindrical double layer of oppositely charged ions. In this event it should be possible to stimulate the nerve by changing electrical field intensities. In order to test this supposition a nerve-muscle preparation was placed between two copper plates separated by distances varying between 2.5 and 7 inches. Experiments were carried out with alternating potentials applied to the plates, and with unidirectional potentials involved in the charge and discharge of condensers of various capacities in parallel with the plates.

The results of experiments indicate that nerve is, in fact, stimuable by alternating electrical fields as well as by electrical fields associated with the charging and discharging of condensers. It is found that the stimulating effect of the field is a direct function of the cosine of the angle which the long axis of the nerve makes with the electrical lines of force. Strength-duration curves based upon the stimulating effect of collapsing fields associated with the discharge of condensers have been obtained. [15 min., slides.]

10:30 A.M. *The Spread of the Achilles Tendon Response in the Intact Organism.* R. C. DAVIS, Indiana University.

Monopolar electromyographic records were taken from corresponding muscles in the four extremities of human subjects while the Achilles tendon reflex was produced in one leg. Records may be divided into two groups on the basis of the waves recorded from the stimulated leg. In the first group there is a rather simple diphasic spike. In the second group the diphasic spike is preceded by a monophasic wave and followed by another. When the second type of record appears, the monophasic waves are accompanied by simultaneous, similar waves from the other ex-

tremities, of one-third to one-half the magnitude. The first waves follow the stimulus with no latent period. After eliminating the possibility of certain artifacts, it is believed that these monophasic waves represent responses in the respective muscles to the force of the stimulus blow, transmitted to the more remote parts by mechanical means. The diphasic waves are indicative of the neurally mediated reflex response. The contralateral leg shows a small, but definite, accompanying wave. The arms show slight, if any, participation in this reflex. The results are in accord with a space gradient hypothesis. [15 min., slides.]

10:50 A.M. *Certain Factors Influencing the Tolerance of Light.* A. R. LAUER, Iowa State College.

The paper covers three series of experiments in which the following variables were studied to determine the effect of opposing light on visual efficiency under conditions of relatively low illumination: (1) intensity of opposing light, (2) angle of opposing light, and (3) color of test object. In all, 40 subjects were used.

A special dark-chamber with realistic color combinations was used to exclude outside light. The subjects were dark adapted under a light-tight hood, and objective measurements made of the amount of light needed to make discrimination of standard test objects possible. The light was controlled by a Ferec-Rand acuity meter and measured by means of photronic cells with Viscor filters.

The results show wide differences in acuity levels when opposing lights are used. The angle of declination from the line of vision is much more important than the intensity of light, and the reflection factor of the stimulus seems to be about equally important in determining the threshold of visibility as well as the threshold of color discrimination. [10 min., slides.]

SOCIAL

Thursday, September 4, 1:15 P.M.

Room 107, Harris Hall

KNIGHT DUNLAP, Chairman

1:15 P.M. *The Field of Social Psychology.* R. B. LIDDY, University of Western Ontario.

An examination of the definitions of their science offered by social psychologists and a review of their research projects leave little excuse for misapprehension as to the nature of the subject matter of social psychology. Many social scientists, however, still appear to misunderstand the field of this science.

Sharp lines of demarcation in science cannot, of course, be drawn. It ought to be recognized, nevertheless, that the social psychologist has a definite task. He studies the reactions of living beings to their social environment. These reactions are of three sorts, viz., conscious activities, unconscious mental activities (certain neural patterns), and behavioral

activities. The precise connotation of these terms should be recognized. By the social environment, which itself is partly the reactions of living beings, is meant (1) other living beings acting as individuals or in organized groups, (2) social systems—for example, democracy, monogamy, (3) sociophysical products—for example, automobiles, books.

Sociologists are often said to study social groups. Inasmuch as these groups are composed of living beings reacting to one another, social psychologists, it is evident, also investigate groups. Anthropologists and others study social systems. But social systems, on analysis, are found to be essentially interrelated beliefs, sentiments, and overt practices; these are human reactions and, therefore, data for social psychologists. The sociophysical products and the numerical and spatiotemporal characteristics of groups and social systems are not activities of living beings. They are, rather, results of such activities. They, therefore, do not come directly under the purview of social psychology. These features of the social environment are data for investigation by sciences other than social psychology. A clearer recognition of these conclusions should contribute to more effective coöperation among social scientists. [15 min.]

1:35 P.M. *Distance Gradients in Psychological Phenomena.* MAPHEUS SMITH, University of Kansas.

The concept of social gradient, which has been the focus of numerous studies of population and socioeconomic data, both within the limits of the city and in the hinterlands of cities, is also of interest to psychologists. Studies of mental disease are particularly noteworthy in this connection. It is proposed that such data as attitudes and intelligence can be investigated in the same way and with similar implications for students of selective migration and effect of environmental change.

Data on over 4000 university students' intelligence tests reveal a slight declining gradient correlated with distance of place of residence from a central city. Possible interpretations of the data are reviewed, and further studies of distribution of intelligence are suggested. Army psychological tests offer the best opportunity for significant studies in this field. [10 min.]

1:50 P.M. *A Physiological and Psychological Critique of Social Liberty.* THOMAS H. HOWELLS, University of Colorado.

Social liberty stands before the court of world opinion, under indictment for vagrancy. It is quite commonly accepted that any system (machine, organism, mind, or society) is efficient in proportion as its components are unfree, *i.e.* are completely coördinated and directed toward an end. System is obviously necessary, even in science, but so also is nonconformity. After all, is liberty merely sterile license?

Factual data are presented in support of the following interpretations: Exact direction of partial activities toward achievement of a given goal is possible only so long as the goal remains the same. The target must not move. Complete systematization of local activities, physical or psychological, can only be achieved when the inclusive system or field is either

fixed or repetitive. But actually this larger field of action, which includes an infinity of minor systems, and also temporal as well as spatial dimensions, is evidently a progressive or evolving whole, rather than a static or cyclical whole. Stereotyped systems are not adapted to the cosmic order; they are effective only within limited areas, for a limited time, and involve a minimum number of interacting parts. They are possible only when the vectorial structure is comparatively simple, and therefore the specific stresses are relatively large and immobile. Variability in the behavior of organs, organisms, or social groups necessarily diminishes the momentary concentration of energy on immediate or specific objectives. But in a shuffling, flowing world, such objectives are constantly shifting and blending. A large degree of internal freedom is necessary for the progressive adjustment of any subsidiary system in the evolving world order.

It is urged that democracy, provided it achieves a dynamic balance between system and freedom, is biologically superior to totalitarianism and in the long run should triumph in the struggle for existence, although at the sacrifice of temporary advantage. [15 min.]

2:10 P.M. *The Constructiveness of Play as Affected by Group Play and Frustration.* M. ERIK WRIGHT, Ohio State University.

The constructiveness of play behavior of subjects in two member groups was studied in an unrestricted play situation and in a frustration situation. Thirty-nine pairs of children, three to five years of age, were used.

Two major questions were raised *re* constructiveness level: (1) Would the regression effect found in single child situations appear in the group situations? (2) Would differences exist between social and solitary play in the group situation?

A four-point scale for level of constructiveness was devised. The correlation between age and constructiveness level was .47. During frustration significant decreases in constructiveness of play occurred. Thus, the regressive effect of frustration upon play observed by Barker, Dembo, and Lewin is shown not to be limited to the single child situation. The correlation between strength of frustration and degree of constructiveness was highly significant, $r = -.50$.

The level of constructiveness for social play was consistently higher than that for solitary play both in the unrestricted and in the frustration situation. Both social and solitary play constructiveness decrease in frustration, but the differences between them increase. Social and solitary play showed the same increase in constructiveness with age in the unrestricted situation.

Not only does the introduction of a social factor as such influence the constructiveness, but, more specifically, the strength of the cohesiveness of the group as measured by the degree of friendship seems to produce a differential effect. The determination of friendship was made prior to the experiment. The strong friends tended to show higher constructiveness than the weak friends both in the unrestricted and in the frustration situations. [15 min., slides.]

- 2:30 P.M. *A Comparison of the Feminine Social Participations of Frequently "Dating" Undergraduate Women With Infrequent "Daters."*
J. E. JANNEY, Cleveland College, Western Reserve University.

What are the differences in the feminine social activities of undergraduate women who "date" frequently as compared with those who "date" infrequently?

For one academic year a representative cross-section of the common social participations of 282 undergraduate women was observed. The 50 most frequent "daters" were contrasted, by means of Vincent's overlapping method, with the 50 least frequent "daters" as regards seven different types of *feminine* activities.

The results appeared to indicate that (a) the gross number of feminine participations does not differentiate the frequent "daters" from the infrequent "daters," but that (b) the frequent "daters" excel in those feminine social activities where positive social acceptance is a selective factor, and (c) the infrequent "daters" excel in those feminine social activities where social acceptance is either passive or unnecessary. [10 min.]

- 2:45 P.M. *Social-economic Status as a Determinant of Student Participation in a State University.* ROBERT C. TRYON, University of California.

The measure of social-economic status of the home neighborhoods (census tracts) of each of more than 5000 university students is chosen as the composite of rental value, crowding, and physical condition of dwelling units. *Participation by enrollment* in the university is highly related to this index, less than 5% of persons of college age coming from "poor" neighborhoods, more than 50% from the "best." That this relation is not merely a matter of difference in average "intelligence" is revealed in a subsidiary study in which it was discovered that in a large all-city high school and among children of similar IQ's a relation exists between social-economic status of home neighborhood and per cent of children from it who elect the college preparatory curriculum. Among university students, even though as a whole group thus highly selected with respect to social-economic status, *participation in social organizations within the university* is furthermore related to social-economic status: fraternities (and sororities) classed as "exclusive" draw members largely from neighborhoods comprising the top social-economic sixth of the metropolitan population, whereas members of the remaining fraternities, of other dwelling units, of coöperative houses, and students living at home are, in the order given, drawn more generously from neighborhoods of lesser status. *Participation in various curricula* appears also to be related to social-economic status: when students are divided into those coming from upper, middle, and lower social-economic thirds of the population, there appear to be significant differences between these groups in the proportions that elect various types of major subjects. It is suggested that some curricula constitute "status symbols," others avenues of social and economic mobility. [15 min., slides.]

3:05 P.M. *Coöperative Behavior in Rats.* WILLIAM J. DANIEL, University of North Carolina.

Will coöperative behavior be obtained when two rats are put into a double motive situation if the satisfaction of either of these motives is contingent upon the behavior of both animals?

In this experiment one rat of a pair had to run to a platform, which shorted out the electrified floor grid of a feeding box, in order that a second rat might feed. With the platform unoccupied, both rats received shocks and neither could feed. One rat had to be on the platform if both were to escape shock and if either was to get food. Frequent position shifts offered the best satisfaction of both motives.

Each pair of rats was run 24 minutes daily. They eventually succeeded in exchanging positions approximately 75 times a day. At the end of the experimental period 90% of the shifts were being accomplished without shock. [10 min., slides.]

3:20 P.M. *Patterns of Competitive, Aggressive, and Altruistic Behavior in the Cat.* CHARLES NELSON WINSLOW, Brooklyn College.

Cats were first trained singly in a 25-foot runway, a problem-box, and a string-pulling situation until they had reached a speed and effort of performance that was judged to be their maxima. Thereupon, other cats similarly trained were introduced as companions with a single piece of food as the goal. Four questions then to be answered were:

(1) Will the animals respond to each other as competitors and hence consequently run faster or work harder in their efforts to reach the food first? (2) Will patterns of altruism emerge? (3) What will be the effects of continuous losing? (4) Will aggressiveness or hostility toward each other appear as the result of frustration in a competitive performance?

In all three of the experimental situations competitive, aggressive, and altruistic behavior appeared, but individual differences in the form and the extent were marked. In the straight-runway, for example, continuous winning tended to produce faster running, whereas continuous losing caused loss of interest or hostility toward the winner. Examples of "displaced aggression" were common when a group of three cats were tested together, the more dominant loser attacking the other loser with tooth and claw, apparently as a response to the frustration in obtaining the food.

Altruistic sharing of the food occurred more frequently than fighting when two cats had pushed levers in problem-boxes to reach a single piece of food placed in the middle. In the string-pulling situation some animals fought for a position before the string or for the food when obtained by another, while other cats stood aside without opposition and let their companions pull the string and devour the food.

The reaction patterns of the cats were correlated with their relative positions in the scale of dominance. [15 min.]

APTITUDE

Thursday, September 4, 1:15 P.M.

Room 100, Speech Building

TRUMAN L. KELLEY, Chairman

1:15 P.M. *Social Background and Art Aptitude of Superior Negro Children.* ALBERT S. BECKHAM, Chicago Board of Education.

The problem was to find out the relationship between interests and art aptitude when intelligence is more or less constant. A group of 100 very superior children was the basis of this study. This group has IQ's above 120 on the Revised Stanford-Binet Scale, Form L.

The two tests used were Tests in Fundamental Abilities of Visual Art (Grades 3 to 12), by Alfred S. Lewerenz, and the Meier-Seashore Art Judgment Test.

The control group was 100 high school pupils who studied art as a speciality. The intelligence of this group was also obtained on the Revised Stanford-Binet.

The group of superior children outrank the art pupils in more than two-thirds of the test items. Individual differences in the drawing of the human form are more pronounced in the superior group. Individual scores are more interesting in the art group.

Individual and social differences were found in color recognition. Intelligence was a more important factor in tints and shades than is generally considered. Home background and types of interests are factors in art aptitude scores. [15 min., slides.]

1:35 P.M. *Grades, Intelligence, and Personality of Art School Freshmen.* ALICE I. BRYAN, Columbia University.

Four freshman classes at the School of Fine and Applied Arts, Pratt Institute, were given American Council on Education Psychological Examination, Minnesota Paper Formboard Test, and Bernreuter Personality Inventory. Grades in design, structural representation, and average art grades were obtained. The total group of 1008 students, 498 women and 510 men, though enrolled in architecture, art education, or design, took the same foundation art courses.

On American Council, the mean for the whole group fell at the 49th percentile, with a range on subtests from 39th (Arithmetic) to 58th (Spatial Analogies). The art education group was superior to architecture and design groups on all but Arithmetic and Analogies. The women ranked higher (54th vs. 43rd percentile) on total score, difference being six times standard error of difference. The men were lower on all subtests except Arithmetic, but the men's grades were not lower than the women's.

On Bernreuter, scored for neurotic tendency, the women's mean was at 47th and men's at 52nd percentile for college students, indicating a

normal group. Mean score for whole group (no sex difference) on Minnesota test was 44.5 or about 77th percentile for liberal arts college freshmen.

Intercorrelations of grades with American Council total score ranged from .10 to .22; with Minnesota, from .08 to .21; with Bernreuter B₁N, from -.07 to .01. The Minnesota test showed correlations with Spatial Analogies of .39 for the women and .46 for the men. No correlation higher than .24 was found between grades and any other variable. This suggests that success of freshman students in Pratt Institute Art School depends upon creative abilities other than those measured by paper-and-pencil tests of intelligence and personality. [15 min., slides.]

1:55 P.M. *Sex Differences in the Understanding of Mechanical Problems.*
GEORGE K. BENNETT and RUTH M. CRUIKSHANK, Psychological Corporation, New York City.

Sex differences have been found by other investigators in connection with tests of mechanical assembly and mechanical information. In the course of construction of a test of mechanical comprehension, marked differences have been noted in the scores obtained by men and women. A 60-item test of pictorially presented mechanical problems has been administered to over 400 young women. The results have been analyzed item by item for this group and compared with those of a group of men of similar age and education. While men are consistently superior in their performance, the difficulty of items is not the same for both sexes. Some items which are very difficult for girls are among the easier for boys. On the other hand, items which are easy for girls are generally easy for boys. There appears to be a differential cultural factor which is responsible to some extent for these differences in performance. [15 min., slides.]

2:15 P.M. *Medical Aptitude Tests.* F. A. MOSS, Association of American Medical Colleges.

During the last 15 years the Scholastic Aptitude Test for Medical Schools has been given to approximately 150,000 students in the United States and Canada. Some 75,000 of these were admitted to medical schools and approximately 70,000 have successfully completed, or will successfully complete, the medical course.

We have been able each year to check the predictive value of the test with the grades made by the students in medical schools. Correlations have also been made between premedical grades and the scores on the Aptitude Test, as well as between certain personality ratings and test scores. A study has also been made between grades on the Aptitude Test and performance as interns. Correlations have also been made between the grades on the Aptitude Test and grades on State Board and National Board examinations which the students took some four or five years later.

At first the tests were used purely experimentally by the medical schools. They were later adopted, however, as one of the normal requirements for admission to medical school and are now used, together with such other criteria as premedical grades, personal interviews, letters of recommendation, etc., for selecting medical students.

This paper will point out some of the difficulties and mistakes that have been made in this work. [15 min.]

2:35 P.M. *A Factor Analysis of a Stenographic Proficiency Battery.* SEYMOUR THOMAS FRIEDMAN, Jewish Vocational Service and Employment Center, Chicago.

A battery of tests designed to measure stenographic proficiency has been developed at the Jewish Vocational Service. The problem raised at this time is: What is the smallest number of abilities that must be postulated in order to account for an individual's performance on this battery of tests? The results will be useful in developing a shorter and more accurate battery of tests and in defining those areas of stenographic ability that need further exploration in order to predict success.

The battery developed at the Vocational Service during the past four years was administered to 300 female stenographers seeking employment. All were high school graduates. The group was tested between October 1, 1939, and February 1, 1940.

The stenographic proficiency test battery consisted of the following subtests: (1) typing speed, (2) typing accuracy, (3) typing from rough draft, (4) transcription of material dictated at three different speeds, (5) a letter form exercise, (6) the Pressey Senior Classification Test, and (7) the Minnesota Vocational Test for Clerical Workers. The variables age and experience were added to the test battery, thus bringing the total number of variables to 11.

Tetrachoric intercorrelations were obtained for the 11 variables. After five factors were extracted by Thurstone's centroid method, the axes were obliquely rotated until a meaningful structure was obtained.

Three factors appear to be easily identifiable: transcription facility, speed of reading, and experience.

The tables of intercorrelations and final factor loadings are presented. [15 min.]

2:55 P.M. *Prediction of Proficiency in Machine Calculation.* ROBERT M. GOTTSANKER, University of California.

Nine tests were selected which were considered to measure abilities needed in the operation of a crank-driven or key-setting calculating machine. This original battery of tests was administered to 67 students enrolled in a business college course in which the use of the crank-driven calculating machine is taught. The scores made on tests of calculating machine work during the semester were used for the criterion of proficiency. The Wherry-Doolittle test selection method was applied to obtain the final test battery.

The original test battery was also administered and then after a two-week interval readministered to 62 students of a university class in tests and measurements. The test-retest reliabilities of the individual tests and of the final battery were determined on the basis of this group. [10 min.]

CONDITIONING

Thursday, September 4, 1:15 P.M.

Room 104, University Hall

ROBERT M. YERKES, Chairman

1:15 P.M. *Higher-Order Conditioning and Generalization.* LOUISE FENGER JONES, University of Wisconsin.

Several variations of procedure were employed in an attempt to establish higher-order conditioning in college students, using finger withdrawal to electric shock. With some subjects, the procedure was the regular one for higher-order conditioning; for other subjects, one or several of the following variations were introduced: (1) The "higher-order" stimuli were never paired with the stimuli of the preceding order. (2) For higher orders, additional incentives were substituted for the shock. (3) Subjects were instructed to try to determine, from what happened during the experiment, what they were expected to do.

"Higher-order" conditioning was obtained in a small number of cases. "Higher-order" responses were also established in some cases without pairing of stimuli, especially if substitute incentives were given. Generalization often appeared at later, rather than earlier, stages of training. Verbal reports indicated attitude, interpretation, and set as important determiners of response. [10 min.]

1:30 P.M. *An Investigation of the Nature of Pseudoconditioning.* DELOS D. WICKENS and CAROL WICKENS, University of Wisconsin.

After a certain response has been evoked several times by one stimulus, another may call out this response, even though the two stimuli have never been paired. This is called pseudoconditioning. It has been suggested that the phenomenon may be the result of a generalized, muscular tension which can be tripped off by any stimulus; or it may be true conditioning, with the conditioned stimulus somewhat hidden, being, perhaps, simply the change of the environment along with the characteristics of that change. The present study was undertaken to substantiate one or the other of these possibilities.

White rats escaped shock by running from one to the other end of a partitioned, soundproofed box, when the grid underfoot was electrified. Following 35 shocks alone, distributed over three days, a light was flashed on in the occupied compartment. The pseudoconditioned response would consist, then, of the animal's leaving that compartment immediately, a response similar to the one made to shock alone. Four groups of rats were used. For one, the shock occurred suddenly and the light occurred suddenly; for the second, both the shock and the light built up gradually, reaching a maximum in five seconds; for the third, the shock was sudden and the light gradual; for the fourth, the shock was gradual and the light sudden.

The results indicate a greater degree of conditioning in the first two groups, which should not have occurred if only a generalized, motor tension were operating to produce pseudoconditioning. It is suggested, then, that pseudoconditioning might be true conditioning, in which the conditioned stimulus is a change or rate of change in the environment. [15 min., slides.]

1:50 P.M. *A Simple Conditioning Explanation of an Avoidable vs. Unavoidable Shock Training Study.* FRED D. SHEFFIELD, Institute of Human Relations, Yale University.

Brogden, Lipman, and Culler (*Amer. J. Psychol.*, 1938, **51**, 109-117) found avoidable shock considerably superior to unavoidable shock as an unconditioned stimulus in training guinea pigs to run to tone in an activity wheel, despite the frequent omission of the unconditioned stimulus in the avoidable shock situation. Several authors have regarded these results as evidence that the Pavlovian formula is inadequate and that shock avoidance reinforces the conditioned avoidant response. However, one unmentioned difference between the two procedures is that unavoidable shock animals are frequently shocked in the midst of a conditioned run, whereas avoidable shock animals are shocked only while sitting. If this difference leads to different unconditioned responses, the Pavlovian formula must accordingly be differentially applied.

An experiment was designed to determine whether shock *while running to tone* in the unavoidable shock situation evoked other responses than running, and to determine whether this was related to subsequent failure to run to tone. Guinea pigs were conditioned in the unavoidable shock setup. A polygraph recorded reaction time, speed, duration, and direction of all responses as indicated by motions of the activity wheel. Animals sometimes ran and sometimes stopped running when shocked in the midst of a conditioned run. Dividing all unconditioned responses to shock *while running to tone* into two groups, *runs* and *stops*, yielded reliable prediction of extent of conditioned running on subsequent trials. Measurements from animals conditioned with *avoidable* shock revealed extinction of conditioned running during successive trials in which shock was completely avoided; 100% conditioning is obtained when a level of performance is reached such that extinction requires at least 25 trials, the criterion of 100% being 25 conditioned responses out of 25 trials. [15 min., slides.]

2:10 P.M. *Higher and Lower Nerve Centers in Flexion Conditioning.* W. N. KELLOGG, Indiana University.

This paper brings together previously unreported data from experiments on flexion conditioning in dogs, which throw light on the neural mechanisms involved in the learning process. (1) G. B. Brundage conditioned animals by the massed method for long periods of time without interruption. Under these conditions of extreme fatigue the CR would temporarily drop out while the UR remained. (2) C. R. Headlee, who conditioned dogs under hypnotic doses of nembutal, noted similar fluctuations in the CR which were unaccompanied by corresponding changes in

the unconditioned flexion reflex. It appeared from these two studies as if the subject could "fall asleep" to the buzz but "remain awake" to the shock or unconditioned stimulus. (3) E. G. Brundage, during extensive conditioning studies of the rear feet in dogs, found that the spread or generalization of the response to the conditioned stimulus was significantly different from the spread or generalization effect produced by the unconditioned stimulus.

Taken as a whole, the data from these experiments tend to support the hypothesis that there are different neural mechanisms for the conditioned and unconditioned behavior of the organism during flexion conditioning. They also argue against interpretations of learning which would localize it in specific regions of the nervous system—for example, in the cerebral cortex. It is probable that the learning of any new act involves both higher and lower centers in the nervous system and demands an extensive integration between them. If this were not so in buzz-shock conditioning, it is unlikely that the unconditioned flexion reflex would be so essential as a motivating device for building up the CR. [15 min., slides.]

2:30 P.M. *Specific Functional Relations Ascribed to the Agranular Motor Cortices, Corpus Callosum, and Contralateral and Ipsilateral Pyramidal Tracts in Conditioning and Extinction.* P. S. SHURRAGER, University of Pennsylvania.

Comparable acute and chronic experiments involving the possible combinations of very specific lesions in Brodman's Area #4 and specific learned responses (CR's) of various legs were performed. In both acute and chronic groups some animals were trained prior to lesions and others after similar lesions. These results are typical of acute preparations trained prior to cerebral ablation: Both cortices were exposed, the animal recovered from anesthesia and was trained to flex the right foreleg to tone. When the CR was interpolated between systematic minute cauterizations within a circumscribed region of contralateral Area #4, the size of the CR diminished as the lesion increased. Finally, the learned flexion became extension accompanied by transferred full flexion of the left foreleg. After similar complete removal of the corresponding area of the opposite cortex, original and transferred CR's failed. After ablation of the left cortical area specific for right hind leg, and without further training, the left hind leg began to respond to the tone. Ablation of the right cortical area specific to the left hind leg resulted in complete failure to condition specifically to tone. Preparations trained after lesions gave substitute, rather than transferred, responses. Chronic preparations showed no direct recovery of specific learned motor function over a maximum period of nine months.

Conclusions: (1) Specific conditioned flexion is accompanied by balanced learning of all muscles, flexor and extensor. (2) Specific learned flexion and extension patterns are located in Area #4. (3) Learned flexion is mediated *via* decussated pyramidal tracts. (4) Learned extension is mediated *via* pyramidal tracts from ipsilateral cortex. (5) Corpus callosum mediates inhibition of learned responses.

Dr. H. C. Shurrager collaborated in these researches, carried on while the author was NRC Fellow, University of Rochester, 1939-1940. [15 min., slides.]

2:50 P.M. *An Attempt to Condition the Galvanic Skin Response to Subvocal Stimuli.* R. H. HENNEMAN, College of William and Mary.

Related to the conditioning experiments of Hudgins on the pupillary light reflex and of Menzies on vasomotor responses, this investigation was planned to discover if the galvanic skin response could be successfully conditioned to a word spoken subvocally by the subject. The first step was the establishment of a CR to a word spoken aloud. The nonsense word "hum-dum" was employed, and shock used as the reinforcing stimulus. Eight of 15 subjects were thus successfully conditioned, the CR in some cases manifesting a marked tendency to resist extinction. Genuine conditioning was verified by having the subjects speak a neutral word in a control series and by running a control group of subjects tested only for "sensitization" from the shock stimuli. Next came the attempt to condition the GSR to the same word spoken subvocally by the subject. After training (word spoken aloud plus shock), test for conditioning was made by signalling the subject with a small light to "think" of the word. Three subjects indicated evidence of conditioning in this situation. Three control procedures followed: (1) The subjects were given the light signal with instructions *not* to think of the word. (2) The subjects decided themselves in advance on a pattern of *word-stimulation* and *no stimulation* when the light appeared. Response differences between "light-plus-word" and "light-alone" trials were recorded. (3) The subjects "thought" of the stimulus word at their own determination, signalling this fact to the experimenter by pressing a light switch with the foot. All three check procedures indicated evidence of genuine conditioning. [15 min., slides.]

3:10 P.M. *Response Errors During Conditioning.* A. G. BAYROFF, University of North Carolina.

This paper describes the work of Robert C. Rogers, graduate student at the University of North Carolina.

The purpose of this experiment was to study the development and the conditioning of a *learned* response with especial reference to the *adequacy*, *i.e.*, the correctness, of the responses during the course of the conditioning process.

The animals were trained to avoid shock by learning to discriminate one of four exit doors (the response to the unconditioned stimulus). When this habit was perfected, an oscillator tone was paired with the shock until the tone alone produced the correct discriminatory response. Finally, the CR was extinguished.

The animals learned to make the discrimination without error to shock alone. On the 50 trials immediately following the first paired stimulations (tone plus shock) significant errors were found in the discrimination habit. Further presentation of the paired stimuli resulted in perfect discrimination. Significant errors again appeared immediately following the first presentation of the CS alone. Further training resulted in perfect dis-

crimination to tone alone. Extinction took the form of longer time and the reappearance of errors.

The type of errors which reappear at these stages of the conditioning process suggests that they are errors in the motor aspects of the conditioned response rather than in actual knowledge of the exit.

The introduction of the CS (paired stimulation) and the withdrawal of the US (CS alone) apparently constitute new stimulus complexes which demand reorganization of the previously established habit patterns. [15 min., slides.]

3:30 P.M. *An Analysis of Certain Nonassociative Factors Inherent in Avoidance Conditioning in the Rat.* J. DONALD HARRIS, University of Rochester.

Grether and Harlow have reported that "pseudoconditioning" in avoidance conditioning situations may produce responses indistinguishable from true conditioned responses. Hilgard and Grant report at least two similar phenomena in eyelid conditioning. Further, Harris has shown adaptation to be important in influencing response level.

The present experiment provides an opportunity for several such nonassociative factors to appear distinguishably in rats. Using shock and buzzer as stimuli, general activity responses were recorded from the Smith metal-bellows stabilimeter. Littermates were cast into eight groups and given training each day for 10 days as follows: (a) placed in apparatus but given no stimuli; (b) given 10 typical forward-order conditioning trials; (c) given 10 typical backward-order conditioning trials; (d) given 10 shocks; (e) given 10 sounds; (f) given 10 shocks and 10 sounds, but in random order.

At the conclusion of this training, all the above groups were given an "extinction" series of 10 sounds a day for five days. Two further groups were given training as follows: (g) given 10 shocks a day for 10 days, followed on the eleventh day by typical forward-order conditioning as in (b); (h) given 10 sounds a day for 10 days, followed by forward-order conditioning as in (g).

From 14 relevant comparisons among groups the following conclusions can be drawn: (1) Certain types of experience with conditioning stimuli may accelerate or decelerate later conditioning. (2) Nonassociative factors may produce responses equal to, or greater than, true conditioned responses. (3) Such nonassociative factors may be shown to be operating in typical conditioning.

The inference is that the interpretation of the conditioning process must consider these factors, together with the associative factors known to be operating in conditioning.

Results from 150 rats will be considered. [15 min., slides.]

LEARNING

Friday, September 5, 9:00 A.M.

Room 107, Harris Hall

HARVEY A. CARR, Chairman

9:00 A.M. *The Concept of Psychological Disposition and Retroactive Inhibition.* R. H. WATERS, University of Arkansas.

The experimental data to be summarized in this paper are interpreted as showing the role of psychological dispositions in producing retroactive inhibition. The term "psychological disposition" is proposed in lieu of such terms as "set," "attitude," "aroused apperceptive mass," and the like.

In general, studies and explanations of retroactive inhibition are based upon the assumption of more or less specific associative linkages between the original and interpolated material. For example, the transfer theory accounts for retroactive inhibition in terms of the intrusion of items from the interpolated list by virtue of assumed associative connections between the various items of that and the original list.

The alternative theory proposed in this paper is that psychological dispositions are aroused by the learning activity, that these dispositions are stimulated by material of the original list, and that the effect of these aroused dispositions is to evoke elements congruous with them from the interpolated lists. The incorrect items are thus related to the aroused psychological disposition and not directly related to the items of the original list. This explanation of retroactive inhibition is in harmony with contemporary field theories of learning and retention. [15 min., slides.]

9:20 A.M. *The Role of the Order of Presentation in Learning.* GEORGE KATONA, Guggenheim Foundation, New York City.

Suppose we learn two related materials, or two different texts dealing with the same material; will learning in the order $A - B$ bring about the same result as in the order $B - A$, as if the equation $A + B = B + A$ would be applicable?

Such well-established factors as recency, retroactive and proactive inhibition may account for certain differences in the results. Of special interest is the search for further factors causing the superiority of one or the other order of presentation. In investigating meaningful learning with extensive transfer effects, the possibility arises that the understanding of the second material may be facilitated by having learned the first, while the reverse may not be the case.

In one experimental series, undergraduate students studied two forms of a scientific topic, a consistent development of the principles (A) and an enumeration of specific data (B), relevant to the same subject matter. Then, either the recollection was tested or application tasks were given, the solution of which was possible on the basis of each text. By testing

the understanding acquired in that way, it was found that groups learning first A and, half an hour later or a day later, B were superior to comparable groups learning first B and then A.

In these experiments, learning A prior to B appears to facilitate that organization of B which is needed for full understanding. By understanding a principle we acquire an adaptable frame of reference which can be complemented easily by specific data. The opposite sequence of first impressing an aggregate of individual data and later adding the theoretical context appears to be less efficient. The experiments tend to confirm a theory of learning which differentiates "learning by understanding" from the acquisition of specific information. [15 min., slides.]

9:40 A.M. *The Influence of Muscular Tension on Pursuit Learning.* FREDERICK A. COURTS, University of Missouri.

Seven groups, each including 32 subjects, practiced for 50 trials on a modified Koerth pursuit rotor. During practice each group maintained a different level of muscular tension induced by squeezing a hand dynamometer. Trials were 20 seconds in length and were separated by 40 seconds of rest.

Total scores for the 50 trials show that there is an optimal degree of dynamometer tension for pursuit learning. Total scores in successive groups of 10 trials show that as learning progresses (1) the facilitative influence of slight degrees of tension becomes greater, (2) the originally detrimental influence of high degrees of tension becomes more marked, and (3) impairment of performance as a result of tensions greater than the optimum occurs earlier in the tension series. [10 min., slides.]

9:55 A.M. *Reminiscence in Discrimination Learning.* DAVID C. McCLELLAND, Yale University.

Reminiscence is frequently explained as being due to the more rapid forgetting of weak wrong than of stronger right responses. An attempt to check this hypothesis was made by comparing the retention of responses to right and wrong stimuli in verbal discrimination learning.

A list of 20 pairs of words was presented in six different counter-balanced orders. Of two words shown simultaneously the 192 subjects had to learn to say one (the right word) and not to say the other (the wrong word). When they had reached a criterion of 15 in 20 correct choices, some continued learning as before to mastery and others after a rest period filled with color-naming.

There was a reliable improvement in relearning scores after a two-minute rest if the pairs were presented at a two-second rate, but not if they were presented at a four-second rate. By combining right and wrong words from original learning with new words in relearning, it was determined that the improvement was localized in the wrong stimulus members of the pairs solely. The pairs to which the wrong words from original learning had been transferred were easier to learn after a 2- and a 20-minute rest than after no rest. The pairs to which the right words were transferred showed no reminiscence.

Here reminiscence cannot be explained by the rapid forgetting of

weak responses, because the weak responses to the wrong words were not forgotten rapidly but actually showed improvement after rest. The results seem best explained by the alternative hypothesis that reminiscence is due to the removal with rest of a performance inhibition, a removal which benefits relearning the wrong word pairs more because they are harder to acquire. [15 min., slides.]

- 10:15 A.M. *Overt Interlist Intrusions and Retroactive Inhibition as a Function of the Ratio of the Degrees of Learning of Original and Interpolated Verbal Habits.* ARTHUR W. MELTON, University of Missouri.

With a fixed degree of learning of the original material an increase in the degree of interpolated learning has been shown to first increase and then decrease the amount of retroactive inhibition. These studies test the hypothesis that the maximal retroactive inhibition will be obtained with a higher degree of interpolated learning the higher the degree of original learning. After 3, 6, or 15 trials on an original list of 16 adjectives, an interpolated list of synonymous adjectives was learned for 3, 6, 15, or 30 trials. All learning was with the anticipation method, and relearning of the first list occurred after 25 minutes. The 12 pairings of degrees of learning were studied in separate subexperiments with 24 or 48 subjects. In each subexperiment the subjects were given two practice days and four experimental days on which they learned under standard work and rest conditions for the measurement of retroactive and proactive inhibition. All conditions were equalized for practice effects.

Results: (1) Maximal retroactive inhibition occurred with 6 interpolated trials when the original list was learned for 3 trials, with 6 or 15 interpolated trials when the original list was learned for 6 trials, and with 15 or 30 interpolated trials when the original list was learned for 15 trials. (2) Intrusions of interpolated adjectives during the relearning of the original adjectives occurred with greatest frequency when the original and interpolated lists were approximately equally well learned.

These results are interpreted as support for the ratio hypothesis and for a two-factor transfer theory of retroactive inhibition. [15 min., slides.]

- 10:35 A.M. *The Recall of Completed and Interrupted Activities: An Investigation of Zeigarnik's Experiment.* G. W. BOGUSLAVSKY and E. R. GUTHRIE, University of Washington.

A critical analysis of Zeigarnik's experiment has revealed an inadequate control of variables and an insufficient statistical treatment of results. In view of the importance of the theoretical implications of Zeigarnik's conclusions, a similar experiment was designed in order to determine whether these conclusions could be corroborated and to attempt a theoretical explanation of the findings.

Eighty college students served as subjects for the experiment. Each subject was presented with 20 short written tasks. The subject was allowed to carry one half of these tasks through to completion, and in the other half he was suddenly interrupted shortly before the end by having the task removed and a new one presented in its place. The arrangement

of interrupted and completed tasks was purely random, and those tasks which were completed by one subject were interrupted for the following subject. Thus, each task appeared 40 times as completed and 40 times as interrupted. Immediately upon completion of the 20 tasks the subject was tested for recall.

The results obtained in this experiment do not verify Zeigarnik's findings. The interruption of a task does not improve its chances of being remembered. On the contrary, the recall indicates a slight margin in favor of the completed tasks. Somewhat more significant is the predominance in recall of those tasks which follow interrupted tasks when compared with those which follow completed tasks. Several other factors tending to improve the chances of a task for recall are suggested by the results. [15 min.]

10:55 A.M. *Contrasting Approaches in Problem-Solving.* S. S. SARGENT, Barnard College.

Individuals solving disarranged word problems manifest two distinct approaches or work methods. With the "whole" approach a subject looks attentively at the pattern of letters, without analyzing them, to see if the solution will emerge. The "part" approach designates trial-and-error combining of letters with the aim of hitting upon a correct syllable or other cue which will lead to solution. Subjects typically utilize the "whole" approach for a few seconds, then turn to trial-and-error manipulation of letters without reverting to the former procedure.

An attempt was made to discover whether performance could be improved, first, by consistent use of the "whole" approach alone and, second, by alternating the two procedures. Subjects were Barnard College students. Three series of 12 disarranged words, equated for difficulty, were used. Each subject was first given a trial series of word problems to train her to introspect out loud as she worked. In the experimental group the first series was solved in the subject's own way. Words in the second series were solved by looking at the whole pattern of letters, with no trial-and-error combinations permitted. Procedure in the third series was to change from "whole" to "part" approaches whenever the one being used proved fruitless. A control group of subjects solved all three series in their own way, without suggestions from the experimenter.

Large individual differences were found. In some cases turning to the "whole" approach caused immediate improvement; in other cases it decreased efficiency or showed no effect. Alternation between the two approaches typically improved a subject's performance. Generally speaking, those subjects improved most whose normal word-solving performance was slow and marked by inefficient "part" procedure. [15 min.]

11:15 A.M. *An Experiment in the Development of Critical Thinking.* EDWARD M. GLASER, U. S. Public Health Service, Chillicothe, Ohio.

The chief problems of this study were: (1) to develop materials and illustrative teaching procedures which may be used effectively at the secondary and college levels to stimulate growth in ability to think

critically; (2) to evaluate the effectiveness of those materials and teaching procedures; (3) to ascertain whether there is a relationship between ability to think critically and certain other factors, such as intelligence and reading ability; and (4) to determine whether these factors are significantly associated with the amount of gain on the critical thinking tests after receiving special instruction in critical thinking.

Four twelfth-grade English classes were used as an experimental group and four equated classes as a control group. Both groups were given a battery of tests. The experimental group alone then received special instruction in critical thinking during their daily English class. At the end of 10 weeks both groups were retested, and other evaluation procedures were employed.

Among the major findings are: (1) The experimental group gained significantly more than the control group in retest scores on the critical thinking tests. (2) The aspect of critical thinking which appears most susceptible to general improvement is the attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience. Development of skill in applying the methods of logical inquiry and reasoning, however, appears to be specifically related to—and, in fact, limited by—the acquisition of pertinent knowledge and facts concerning the problems of subject matter toward which the thinking is to be directed. (3) There was a correlation of .33 between IQ and amount of gain on the critical thinking tests after special instruction. (4) Ability in language and reading comprehension is closely connected with ability to think critically. [15 min.]

11:35 A.M. *The Effect of Electric Convulsive Therapy on Memory.*
JOSEPH ZUBIN, New York State Psychiatric Institute and Hospital.

Because of the clinically reported losses in immediate memory in mental patients receiving electric shock therapy, an attempt was made to determine experimentally the extent and nature of such losses. Paired associates of commodities with nonsense brand names were utilized, and the saving, recall, and recognition methods were used to check on memory losses. The first two methods indicated that the electric shock wiped out evidence of retention of this material. However, the recognition method indicated some loss but considerable retention. In general, the learning immediately before shock was retained less well than learning that preceded shock by a longer interval. Some significant differences were found between purely verbal material and verbal-motor material.

This study was carried out with the coöperation of Dr. S. Eugene Barrera, principal research psychiatrist, and the assistance of Miriam Rosenbaum and Maurice Rogers. [10 min., slides.]

CONFLICT AND FRUSTRATION

Friday, September 5, 9:00 A.M.

Room 104, University Hall

CLARK L. HULL, Chairman

9:00 A.M. *Environmental Background and Resistance to Conflict in the Dog and Sheep.* QUIN F. CURTIS, West Virginia University.

Mr. Donald L. Grummon, of the Ohio State University, collaborated in these experiments.

This study seeks to investigate some environmental factors occurring outside the laboratory test situation which may influence an animal's resistance to experimental behavior disruption in a conflict situation. (1) Is it possible to increase resistance to conflict situations by a social background providing training in "dominance" over the environment? (2) Is it possible to increase resistance by emphasizing the "security" aspects of the environment outside the conflict situation? (3) Is it then possible to precipitate a breakdown by destroying these "security" aspects?

A dog and a sheep were subjects in this experiment, rough controls being elsewhere provided. Both underwent a laboratory routine of conditioned differentiation of metronome beats, whose conflict value was kept approximately constant. The extralaboratory environment was varied as follows: (1) For the sheep, training in competent independent adjustment to various natural environments was given from birth. (2) For the dog, the environment was made socially "secure" by providing for two years a stable relationship of dependence of dog on experimenter. (3) Later, the dog's environment was rendered "insecure" (a) by variable daily confinement in a small kennel which punished escape attempts by electric shock, (b) by introducing a "rival" dog, (c) by experimenter's adopting unpredictable friendly or harsh attitudes without reference to the dog's actual conduct.

The effect of these techniques on behavior in the standard conflict situation suggests that the ability of the dog and sheep to resist strain is strongly affected by early training and by stresses which occur outside the laboratory test routine.

These experiments were performed in the laboratory of Ohio State University. The Works Progress Administration provided competent laboratory assistants. [15 min.]

9:20 A.M. *Sound-induced Seizures in Groups of Rats Maintained on Different Levels of Vitamin B₁ Intake.* ROBERT A. PATTON and HARRY W. KARN, University of Pittsburgh.

This experiment was designed to investigate the incidence of sound-induced convulsive seizures in groups of rats maintained on varying levels of vitamin B₁ intake. The effects of additional vitamin and mineral supplements on the incidence of seizures were also investigated. A constant test situation was used with a resonated buzzer as the sound source.

Young albino rats 30 days of age and averaging 50 grams in weight were divided into five groups of 25 animals each. All groups received a

basal vitamin B₁ diet. Animals in four experimental groups were supplemented daily with different levels (5, 10, 15, and 50 gammas) of vitamin B₁. On a paired-feeding basis their food allowance was determined by the voluntary consumption of the group receiving the lowest vitamin B₁ intake. A group of control animals received the deficient diet *ad lib.*, and in addition received a daily supplement of 50 gammas of vitamin B₁.

Auditory tests given every other day showed a high incidence of convulsive seizures in all experimental groups during a 40-day period. No seizures were observed in the control animals.

When additional vitamin and mineral supplements were given (with individual food intakes restricted to a low level), all experimental groups showed a marked decline in sensitivity during a 20-day period. A continuation of all supplements plus a higher food allowance resulted in a continued decline of sensitivity during the following 20 days.

These results provide additional evidence that both a low caloric intake and a deficiency of essential food substances are important factors in the etiology of sound-induced seizures in the rat.

This study was carried out in collaboration with C. G. King, of the University of Pittsburgh. [15 min., slides.]

9:40 A.M. *Some Fundamental Characteristics of Convulsions in Rats.*
M. M. PARKER, Ohio State University.

(1) Are Maier-type convulsions subject to adaptation or learned control under repeated stimulation? (2) What is the nature of the individual differences in frequency with which rats will go into convulsions? (3) Is there a consistent temporal pattern in the convulsion of the individual rat as indicated by time of onset and duration of the fit? (4) Are there changes in the reactivity of the animal which may be considered diagnostic?

A total of 300 rats were subjected to a standard air blast in a closed, soundproof chamber. One trial per day was given for 30 days.

Very little adaptation to daily exposure was found. There were marked individual differences in the frequency with which convulsions occurred, the frequency falling into a normal type of distribution rather than into a dichotomy of "convulsive" and "nonconvulsive" animals. The individual rat showed a marked consistency in its tendency to exhibit a fit, in the temporal pattern of the fit, and in the kind of behavior shown prior to the coma.

This study was carried out in collaboration with Q. F. Curtis, of West Virginia University. [15 min., slides.]

10:00 A.M. *Electroencephalographic and Other Physiological Aspects of Audiogenic Seizures in Rats.* DONALD B. LINDSLEY and FRANK W. FINGER, Emma Pendleton Bradley Home and Brown University.

Attention has recently been focused on seizure-like behavior induced in the rat by high-pitched tones. The purpose of this study has been to investigate such behavior and (1) to determine the nature of the electroencephalographic changes in relation to those found in other convulsive

states, (2) to measure heart rate in the intact and vagotomized animal, and (3) to determine the effect of physical (restraint) and physiological (curarization) restrictions upon susceptibility to sound-induced seizures.

Twenty-six rats with a history of audiogenic seizures were subjected to a total of 207 stimulations by high-pitched tones. Of 166 stimulations applied to unrestrained animals 14% resulted in seizures. Of 41 stimulations applied to physically restrained animals none resulted in seizures. Twenty stimulations of partially curarized animals resulted in only one questionable seizure.

Marked changes in heart rate occurred immediately preceding, during, and following seizures. During stimulation, but prior to the onset of seizures, heart rate was either sharply increased or decreased; following seizures there was invariably a pronounced slowing and irregularity of heart action. Even in animals not showing seizures heart rate changes occurred as a result of stimulation. No changes in heart rate occurred in vagotomized animals during stimulation, and no seizures resulted.

Electroencephalographic changes before, during, and after seizures will also be discussed.

Charles E. Henry collaborated in the study. [15 min., slides.]

10:20 A.M. *The Permanent Nature of Abnormal Fixations and Their Relations to Convulsive Tendencies in the Rat.* NORMAN R. F. MAIER and JAMES B. KLEE, University of Michigan.

A previous study demonstrated that rats develop abnormally strong position habits (resulting from frustration situations on the jumping apparatus) which prevent the rat from performing a simple discrimination. After several months' vacation these rats were again given a series of tests involving the same discrimination. Seven out of 10 retained their "fixations" throughout the testing period despite "neurotic" seizures produced by conflict situations, and metrazol-induced convulsions. Thus, the fixations are relatively permanent in nature. Nonfixated rats quickly regained their discriminations and maintained them throughout this experiment. Development and continuance of "fixations" depended on individual predispositions as well as frustration.

Tendencies to form fixations and to show "neurotic" seizures were unrelated. As there was a quicker reduction in seizure frequency for fixated than for nonfixated rats during the experiment, fixations may be regarded as a form of adjustment to conflict situations.

Frequency of attack was greater when the situation demanded a jump to the negative card than when it demanded a jump to the positive card. Nonfixated rats had a greater frequency of attacks where there was no choice than where choice between positive and negative cards was possible, particularly when choice and no-choice situations were alternated. The hiss of air was present in all situations so that differences found must be attributed to other factors.

Metrazol injections, given earlier in the day, had no effect on fixations or abortive jumping. They did increase the number of "neurotic" seizures by 74%, reducing the relative effectiveness of the negative card. Two rats now had attacks who had never had them prior to metrazol injections.

The metrazol seemed to produce a temporary psychological condition which increased the animal's disposition to "neurotic" seizures. [15 min.]

10:40 A.M. *Reactions of Children to Experimentally Induced Frustration.* E. A. HAGGARD and G. L. FREEMAN, Northwestern University.

Degree of internal arousal (palmar skin conductance) and its overt expression in specifically directed and nondirected restless movements were measured in 20 boys before, during, and after an experimentally induced frustration involving failure and loss of previously attained reward. By applying the concept of RQ, or physiological recovery quotient (relation of recovery to arousal in skin conductance changes), it was found that: (a) differences in initially high or low skin conductance are unrelated to subsequent patterns of behavior; (b) boys who discharged aroused energies through overt activity tended to recover more rapidly; (c) those who directed aroused energies on a relevant problem tended to recover more rapidly than those whose overt expression was less specifically directed; and (d) those who showed greatest variability in physiological processes during the test tended to recover slowly from experimentally induced frustration. (These findings are significant at the .05 level in Fisher's tables.) [10 min.]

10:55 A.M. *Changes in Cardiac and Respiratory Activity in States of Frustration.* JOHN IRVING LACEY, Cornell University.

Some data collected in the course of an investigation of frustration are here brought to bear upon two problems: (a) Is there a positive correlation between extent of physiological change and the "intensity" of an aroused emotion? (b) Are qualitative differences in the aroused emotions correlated with different directions of change (increase or decrease) in physiological function?

The frustration-situation employed was as follows: The observer was strapped into a chair and instructed to remain motionless. Midway in a supposed "rest-period," cowhage was rubbed into O's back. This induced a severe burning itch and a strong desire to scratch and to move about violently. This desire was frustrated by the conditions of the experiment.

The verbal reports were ranked in terms of the "intensity" of the emotional reaction. Kymographic records were analyzed for heart rate and heart rate variability, for I-fractions (inspiration-time divided by the time required for inspiration plus expiration), and I-fraction variability.

The main results are: (a) Measures of *variability* increase reliably from a normal- to a frustration-period; measures of *level* increase (or decrease) unreliably. (b) *For all physiological indices*, statistically unreliable trends were found for the extent of physiological change to decrease with decreasing motion. (c) For heart rate, it was found that those O's who demonstrated success in restraining themselves from movement exhibited cardiac *deceleration*, whereas those O's who moved about considerably exhibited cardiac *acceleration*. The difference is highly significant. This relationship is not found for the other physiological measures.

The results will be discussed in their relation to Cannon's emergency theory and to the recent suggestion that cardiac acceleration in states of emotion is due mainly to muscular exertion. [15 min., slides.]

11:15 A.M. *Aggression and Withdrawal in Relation to Possible Frustrating Factors.* RICHARD M. PAGE, Northwestern University and Chicago Board of Education.

A detailed analysis of educational, mental, personality, health, and social factors is recorded on a Hollerith tabulating card for every child examined by the Bureau of Child Study. Through the coöperation of Dr. Grace Munson, Director, these cards were made available for making intercomparisons between aggressive children, withdrawn children, and children neither aggressive nor withdrawn as judged by the examining psychologist. Separate comparisons were made between white and Negro children of each sex. The number of cases varied considerably among the 12 groups, the median number being 159. A complementary study of 3327 white boys was also made by noting the proportions in which various personality traits were indicated when the cases were classified by single factors such as "broken home" or "reading disability." Critical ratios were computed of all differences between the per cents and ratios below 2 were rejected; one-third of the retained ratios were in the magnitude of 3 or more. Aggression in children appears to be not as much a response to frustration as it is a type of behavior arising from unwise or inadequate home supervision; withdrawal is apparently not as much an adjustment to a specific handicap as it is to general inadequacy, physical, social, or mental. Certain factors were found that were associated with reliably distinct trends toward either withdrawal alone or aggression alone or both together, and others showed diminished incidence of withdrawal or aggression alone or both together. Striking sex and race differences were found. There was little evidence to support acceptance of many of the factors commonly believed to lead to aggression or withdrawal, such as reading disability, speech disturbance, repeating school grades or being average for grade, living in crowded home, being the youngest child or only sibling of opposite sex. [15 min.]

11:35 A.M. *Cultural Definition of Objectification and Subjectification of Failure and Its Relation to Certain Neurotic Reactions.* L. M. HANKS, JR., University of Illinois.

Clinical psychologists have shown that neuroses with such reactions as self-condemnation, personal insecurity, and feelings of inferiority result from goal-blocked activity which has been *subjectified*; i.e. the failure is attributed by the individual to some personal characteristic rather than being attributed to the objective world or *objectified*. This paper proposes that many situations in which failure is subjectified are defined as subjectifiable situations by the culture. Also it proposes that where such failure is not subjectified, but is objectified by the culture, the aforementioned neurotic reactions do not occur or are rare.

Certain goal-blocked activities are taken from studies of the Northern Blackfoot, conducted by the writer. They are: loss of wealth, death of a

child, and a physician's failure to cure a sick man. Several cases are given of each of these goal-blocked activities showing that the failures were culturally objectified and that none of the aforementioned neurotic reactions developed. Brief comparison is made with our culture where failures of the foregoing kinds are frequently subjectified and where neurotic reactions develop. [15 min.]

PERSONALITY, I

Friday, September 5, 9:00 A.M.

Room 100, Speech Building

R. M. ELLIOTT, Chairman

9:00 A.M. *Study of Personality in Terms of Value.* REGINA WESTCOTT WIEMAN, Consulting Psychologist, Chicago, Illinois.

Behavior is motivated by values and valuing. Everything an individual does is an effort to put himself into relations which yield greater satisfaction, actual or anticipated. What we call "personality traits" are residuals of previous efforts to attain satisfaction. A value can activate only after the personality has convincingly experienced it, although the sampling may be partial or indirect. Increase of satisfaction involving appreciative consciousness can be found only by multiplying the diversity and scope of qualities and meanings, *i.e.* by growth of value. Hence, values are the most promising approach to the study of personality.

Here viewed, *value* is that growth of connections relative to any sensitive organism which quickens appreciative consciousness; *personality* is the sum total of dispositions to reaction, herein called *valuings*, acquired by the biological individual through human communication. Each personality presents a unique organization and incalculable number of valuing, ranging from unconscious ones of organic sense and early conditioning to acutely conscious ones of passionate desires and ruling concerns.

To study a personality in terms of value involves, first, discovering the configuration of his more significant values and valuing, his modes of seeking satisfactions, and his total readiness for growth of appreciative consciousness; second, diagnosing the factors which prevent him from attaining appropriate satisfaction; and third, distinguishing those conditions required to promote appropriate growth of value.

The criteria for determining which are better and worse conditions in any specific situation are developed from three sources: a theory of value based upon critical study of human strivings; all scientific materials bearing upon the fields; and personal judgments of the psychologist, formulated under guidance of these two first sources, augmented by appropriate professional training, and kept rectified by disciplines which safeguard his own objectivity and growth of appreciative consciousness. [15 min.]

9:20 A.M. *Cultural Shifts in Weights of Attitude Items.* PAUL R. FARNSWORTH, Stanford University.

For some years it has been known that the weights of attitude items remain relatively constant regardless of the views of the populations on which the tests have been standardized. From this fact there has come the conclusion that item weights will suffer no alteration over a long period of time.

In the study to be here described this conclusion has been put to test with the use of the Thurstone-Peterson Scale of Attitude Toward War. A restandardization of item weights has shown that a number have changed appreciably in value. The use of these new weights was found to give a very different picture of the war attitudes of a group of students. There is, then, a cultural shift in the meaning of certain attitude items. One must question the use of old weights in longitudinal studies. [10 min.]

9:35 A.M. *The Relationships of Attitude Toward Vocation, Home Environment, and Certain Other Variables.* H. H. REMMERS, Purdue University.

Data on about 1300 urban high school seniors with respect to the following variables were collected: attitude toward types of vocations, including approximately the total range of social acceptability of all vocations, measured home environment, sex, color, number of children in the family, parents' occupation, parents' educational level, vocation desired by respondent, school marks, intelligence, and percentages of pupils desiring to enter specified vocations. The interrelationships of the variables will be presented with interpretations of psychological, educational, and social implications.

W. A. Kerr and Eleanor Breemes collaborated in the study. [15 min.]

9:55 A.M. *The Cultural Genesis of Masculinity-Femininity.* LEONARD W. FERGUSON, University of Connecticut.

The purpose of this study was to determine some of the cultural origins of masculinity-femininity. Upon the basis of results secured from the administration of Terman and Miles' "Attitude-Interest" (M-F) Test to 326 subjects the 25 most feminine-scoring men, the 25 most masculine-scoring men, the 25 most feminine-scoring women, and the 25 most masculine-scoring women were selected as groups for study. The masculine-scoring group and the feminine-scoring group for each sex were compared with each other in terms of the responses made to a 320-item background questionnaire covering many phases of childhood experience.

The major results secured are as follows: (1) Most of the differences between the masculine- and feminine-scoring groups are slight; (2) the majority of the responses that appear to differentiate the masculine- and feminine-scoring groups are related both to masculinity in men and to femininity in women, or to femininity in men and to masculinity in women; (3) a small number of items appear to be related to femininity in both of the sexes; and (4) practically no items at all are related to masculinity

in both of the sexes. The data are shown to be consistent with the hypothesis that pleasant and desirable childhood experiences enabling the child to accept appropriate models of the culture pattern he is to adopt lead to the acquisition of the "normal" behavior patterns, among these being femininity in women and masculinity in men. Conversely, unpleasant or undesirable childhood experiences cause the child to reject the normal models and to acquire behavior patterns which are atypical, *e.g.*, femininity in men and masculinity in women. Agreement of the data with the observations of other investigators is discussed. [15 min.]

10:15 A.M. *An Experimental Study of Suggestibility in Extroverts and Introverts.* JAMES P. PORTER, Ohio University.

Two groups of subjects, formed on the basis of their scores of extroversion-introversion on the Bernreuter Personality Inventory, were given five tests of suggestibility, including the Binet progressive weights test, Brown's auditory and olfactory test, an illusion-of-warmth test, and a prestige test. The findings of each test added together made a scale of suggestibility of 25 possible points.

The differences in mean scores between these two groups on the tests were small, but in the same direction, with the exception of the progressive weights test. The difference in mean scores of the two groups on the entire suggestibility scale was 1.21, which, though a small difference, proved to be statistically significant to the extent that the chances are 1 to 24 that the difference is due to chance alone. However, upon the separation of the males and females within each group, it was found that this difference was a sex difference. The difference in means of the total suggestibility score was 4.12 points in favor of the female extroverts. This difference is statistically significant.

The correlation of suggestibility with the Bernreuter score of introversion-extroversion was $.25 \pm .06$; of suggestibility with the total point-hour ratio, $-.34 \pm .06$; and of suggestibility with the college ability (Ohio State Psychological Examination, Forms 18, 19, 20, 21) score, $-.26 \pm .06$. Both of the latter show an inverse relationship between suggestibility and intelligence, as indicated by the O.S.U. Psychological Examination, and between suggestibility and scholarship, as indicated by the point-hour ratio.

Findings: (1) Extrovert women show a marked tendency to be more suggestible than introvert women, while there is no obvious difference for extrovert and introvert men. (2) There is no significant difference on the college ability scores or scholarship between extroverts and introverts. (3) Suggestibility seems to be inversely related to both scholarship and college ability.

Credit belongs to Mr. J. H. L. Roach, graduate assistant in psychology, for the major amount of work in this study. [15 min., slides.]

10:35 A.M. *Alternative Manifestations of Motivational Tendencies.* ELSE FRENKEL-BRUNSWIK, Institute of Child Welfare, University of California.

As a possible help for integrating material on adolescents, comprehensive ratings of motivational tendencies were used, based on inferences

from a variety of situations extending over a long period and utilizing conspicuous, as well as subtle, behavioral cues. The interrater agreement (reliability) for these interpretative, clinical ratings is satisfactory. Correlations with behavioral ratings made in specific social situations two years previously by partly different raters indicate that in a number of instances those rating high on a certain drive tend to show alternative manifestations of an "either-or" type. Such patterns are characterized by a combination of high correlations of a drive-item with each of two behavior items, with the two manifestations showing no interrelationship. Multiple correlations were used to represent the closeness of the relation between drive-item and the joint set of alternative manifestations. Thus, in 47 boys the rated drive for "recognition" correlated .53 with "social self-confidence" and .46 with "tenseness" (raw coefficients), and the latter two items correlated $-.08$ with one another, yielding a multiple correlation of "recognition" with "social self-confidence and/or tenseness" of .74. Among 44 girls those high on "aggression" tend to be either "socially self-confident" (.45) or "irritable" (.74), the latter two items correlating .00 and the multiple correlation being .87. Generally, the drive-items "recognition" and "aggression" are alternatively linked to overt and successful social activity and/or to emotional maladjustment. Multiple correlations between one drive and more than two manifestations will also be discussed as well as various complex statistical relationships between two drives and one manifestation, including partial correlations. The resulting regrouping of behavioral data in terms of assumed underlying dynamics is shown to be a help in organizing and validating various types of material in personality research, including self-reports and projective data. [15 min., slides.]

10:55 A.M. *Personality Correlates of Level of Aspiration.* JOHN W. GARDNER, Mount Holyoke College.

Five tasks were administered, in individual sessions, to 117 college girls. The tasks were color-letter substitution, syllogisms, word-grouping, and analogies. Each task was divided into 8-10 trials, and prearranged scores (same for all subjects) were reported back to the subjects. After the subject had received her score on a given trial she was required to state her expectations for the succeeding trial. Discrepancy between level of past performance and expectation of future performance (the so-called D-score) was the chief measure taken. On the basis of D-scores, the subjects were divided into several groups: a high positive group, with very high D-scores on all five tasks; a low positive group, with D-scores above zero but not particularly high or not consistently high; a negative group, with D-scores below zero on all five tasks; and a mixed group, consisting of individuals whose scores varied (within a moderate range) above and below zero.

These groups were then compared on a variety of factors: test intelligence, grades, certain social traits (associates' ratings), certain self-attitudes (self-ratings), and the Allport-Vernon Study of Values. Numerous reliable differences were found between the various groups. The interpretation of these differences is discussed. [15 min., slides.]

- 11:15 A.M. *Level of Aspiration as a Controlled Method of Personality Study Using Selected Groups.* JULIAN B. ROTTER, Indiana University.

The present study is the extension of a previous paper presented at the 1940 A.P.A. meetings which described a technique using a level of aspiration situation that presented controls in the selection of a task and instructions not present in earlier studies. This technique, although differing somewhat from others involving the level of aspiration situation, appears to be governed by forces similar to those operating in the other studies. A logical analysis of the situation used plus a study of the actual results obtained suggest that the situation is primarily of a problem nature demanding self-evaluation upon the part of the subject. The present study uses this technique with a variety of groups, including men and women college students, employees of a state hospital, crippled college students, and prison inmates, in an effort to determine the basis for individual differences in the reactions of subjects. The prison inmates are subdivided into groups on the basis of personality trends they have shown as determined by case-history and interview methods. A total of 205 cases were used.

The data obtained eliminate abstract judgment, variability of achievement, and level of achievement as influencing the individual differences in this situation and present positive factors in terms of characteristic personality patterns. These patterns might best be described by the terms emotional stability, feelings of inadequacy, inferiority, or insecurity, and method of defense or compensation to meet the feelings of inadequacy. A further demonstration of the generality of traits shown is evidenced in the analysis of grade predictions of 45 of the subjects. [15 min., slides.]

- 11:35 A.M. *The Operation of the Degree of Effort in Experimental Situations and Its Relationship to the Level of Aspiration.* G. K. YACORZYNSKI, Northwestern University Medical School.

The concept of the *degree of effort* was formulated to explain the atypical scores of some individuals in completing a task which can be solved by different methods of unequal difficulty. Although the more difficult methods of completing the task were available to the individuals, many of them persisted in using the less difficult methods. It was postulated that the individual who uses the most difficult methods available to him is exerting a *maximum degree of effort*, whereas the individual who is satisfied to reach the same results by less difficult methods is exerting a *minimum degree of effort*.

The task used to differentiate the subjects could be completed by methods which are used by individuals below the mental age of eight years or by methods which are available only to individuals with a higher mental age rating. The use of the former methods requires a minimum, and of the latter a maximum, degree of effort.

The operation of the characteristic thus defined should effect experimental results in certain predictable ways and should be related to other motivational characteristics. Forty subjects in each of three experiments

showed that: (1) of four predictions concerning the relationships of time and efficiency scores on the test situation which was used to differentiate the groups, three were verified by the results; (2) the same relationships were found, in part, in other experimental situations; and (3) contrary to expectation, the individuals who exert a minimum degree of effort have a higher level of aspiration than those who exert a maximum degree of effort. The implications of these results are discussed. [15 min., slides.]

CEREBRAL FUNCTIONS

Friday, September 5, 1:15 P.M.

Room 107, Harris Hall

CARLYLE JACOBSEN, Chairman

1:15 P.M. *Visual Depth Discrimination in the Cat.* JOHN L. KENNEDY, Tufts College.

This paper is a preliminary report of experiments on the visual distance perception of the cat with special reference to the brain localization of this ability. An apparatus for determining visual depth thresholds will be described. The difference thresholds for two animals with the standard stimulus 70 cm. from the choice point were identical at 4.5 cm. The "binocular" part of the visual area was removed in both animals, after which they were retested in the same situation. The modifications of visual depth discrimination thresholds resulting from the operations will be described. These results will be discussed in relation to hypotheses concerning cortical and subcortical function in mediating stereoscopic acuity. [10 min., slides.]

1:30 P.M. *The Visual Cortex and Cone Function.* WILLIAM E. KAPPAUF, Princeton University.

This paper summarizes the results of an animal experiment on flicker discrimination which bear on the often cited problem of the relation of cone function to the cortical visual areas.

At a previous meeting, data were presented which described for the normal cat the dependence of the critical frequency for flicker discrimination upon stimulus brightness. The curve describing this relation was divided into two segments. For two animals this was true only after extended training, but it was considered most probable that the division represented a transition from dominant rod to dominant cone function. The transition paralleled the rod-cone shift in the curve for human subjects and occurred at a higher brightness level, as would be expected from the lower density of cones in the cat retina.

The present report concerns critical flicker frequency measurements for four animals tested in the same two-choice discrimination situation after they had been subjected to bilateral removal of the striate cortex. Three had been among those normal animals studied. The fourth was

trained in the flicker habit and operated soon afterwards. During post-operative trials, one animal failed to regain his preoperative level of discrimination at high brightness. Observations on the other three, however, provided definite evidence that the curve of critical frequency still displayed two segments, the second of which began at a brightness level of about one millilambert. In these three animals there was no postoperative reduction in the frequencies at which they could discriminate flicker at any of the higher brightness levels. From behavioral data it was inferred that the visual area lesions were bilaterally complete in each animal. Histological determinations of their exact extent will be available shortly.

The data suggest that cone function, at least as it may be determined from records of the present sort on flicker discrimination, may be mediated by subcortical centers.

These experiments were carried out at the University of Rochester. [15 min., slides.]

1:50 P.M. *An Analysis of the Binocular Vision of Individuals With Complete and Partial Section of the Corpus Callosum.* CHARLES S. BRIDGMAN, Ohio State University.

The investigation reported here was carried out on individuals who had undergone section of the corpus callosum in a special program of remedial neurosurgery carried out at the University of Rochester School of Medicine.

Because of the special anatomical arrangement of the visual projection system (right half of each retina connected to right visual cortex, etc.), it is apparent that under certain conditions of binocular stimulation there must be assumed an integration of neural effects carried from heteronymous halves of the two retinae to the right and left visual cortices. Such integrations must be mediated *via* anatomical connection between the two hemispheres.

Tests have been carried out to determine whether section of the callosum interferes with binocular functions of the sort mentioned above, in which it might be assumed that the callosum provided the necessary interhemispherical anatomical connection. Two types of functions have been investigated. One type involved disparate stimuli which fell on opposite sides of the midlines of the two retinae, necessitating an interhemispherical integration for the perception of depth. The other type involved stimuli which, by the aid of prisms, produced either crossed or uncrossed diplopia. It was then determined, by reducing the prism power, how much convergence or divergence the subjects would exert to overcome the diplopia, *i.e.*, to "recover fusion," in response to the diplopia-producing stimuli which were arranged always to fall on opposite sides of the midlines of the two retinae.

Results indicate that section of the callosum has no significant effect on binocular perception of depth, even in the specific type of situation outlined above, but that probably the recovery of fusion function is adversely affected.

The study was made in collaboration with K. U. Smith. [15 min., slides.]

2:10 P.M. *The Neural Locus of Fusional Processes Basic to Movement and Depth Perception in Vision.* KARL U. SMITH, University of Rochester.

Experiments carried out on laboratory animals have shown that real and apparent-movement vision may be observed in residual form after complete removal of the visual projection centers of the cortex or, in the guinea pig, after complete bilateral decortication. These results have indicated that monocular fusional phenomena, necessary for both real and apparent movement, may be provided by subcortical centers in the absence of the optic centers of the cortex. Tests of binocular fusional phenomena on human patients, in whom the corpus callosum has been sectioned completely, have shown that fusion of binocular images (involving nonhomonymous disparity) may be accomplished in the absence of direct neural connections between the two occipital lobes. The data from these two studies combined seem to prove that all fusional processes in vision, both monocular and binocular, may be achieved in part by mechanisms at the subcortical level. [15 min., slides.]

2:30 P.M. *The Effect of Drugs on Behavior and the Electroencephalograms of Children With Behavior Disorders.* CHARLES E. HENRY, Emma Pendleton Bradley Home and Brown University.

It has been shown (Lindsley and Cutts, *Arch. Neurol. Psychiat., Chicago*, 1940, **44**, 1199-1212) that there is a higher incidence of abnormal phenomena in the electroencephalograms of behavior problem children than in those of normal children. The present report represents a study of the influence of different types of drugs on the electroencephalogram and behavior in a group of problem children.

Fourteen behavior problem children were studied. Electroencephalograms and behavior ratings were obtained each week during the following regime: a control week with no medication; three successive weekly periods with benzedrine, phenobarbital, and dilantin, respectively; and a final control week without medication. The electroencephalograms were recorded under standard conditions from occipital, parietal, precentral, and frontal regions of the head and were submitted to detailed analysis. The behavior of each child in two different areas of activity, on the ward and on the playground, was evaluated by experienced observers on a specially constructed behavior rating scale consisting of a large number of undesirable characteristics.

The results show that behavior was markedly improved by benzedrine and to a lesser extent by dilantin. Behavior was unfavorably affected by phenobarbital. The amount and character of the abnormal activity in the EEG's were not greatly modified, although certain changes in the normal characteristics of the EEG's were associated with modifications of behavior induced by the drugs. Benzedrine and dilantin, which have similar effects on behavior, have differing effects on the EEG. Individual relationships between behavior and the EEG will also be discussed.

Donald B. Lindsley collaborated in the study. [15 min.]

2:50 P.M. *Brain Potentials of the Deaf and Dumb.* B. K. BAGCHI, Calcutta University and Bose Institute.

By means of a specially constructed low-frequency, high-amplification, four-stage, push-pull, capacity-coupled voltage amplifier, first of its kind in India, having a time constant of about .7 second and a dynamic ink-writer, brain potentials were led off the temporal, frontal, central, and occipital regions of 16 congenitally deaf and dumb persons from 7 to 22 years of age and also normal persons placed comfortably in a dimly lighted electrostatically shielded room.

Results indicate that the distribution of the occipital alpha index of the deaf and the dumb is about the same as that of the normal hearers. But there was in practically all cases an overwhelming preponderance of what appeared to be beta potentials (18 to 25 per second) in the temporal region of the deaf and dumb as distinguished from their nontemporal regions and the temporal regions of the normal hearers. The latter exhibited in their temporal regions low-voltage potentials quite different from those of the deaf and dumb. Other findings will be presented in connection with the defectives, and the point discussed as to whether the functional abeyance of the auditory (temporal) region of the cortex of the deaf and dumb is responsible for the observed potentials.

Acknowledgment is due to Principal A. C. Chatterji and Mr. N. C. Bagchi, of Calcutta Deaf and Dumb School. [15 min., slides.]

3:10 P. M. *Changes in Energy Distribution in the Electroencephalogram Following Thyroid Feeding.* GEORGE L. KREEZER, Cornell University, FRANKLIN W. SMITH, Letchworth Village, and HAROLD E. HIMWICH, Albany Medical School.

The present study was conducted at Letchworth Village. Its purpose was to determine the influence of thyroid feeding on the electroencephalogram in a group of cretins. The familiar report of a rise in intelligence level of cretins as a result of thyroid feeding suggested it would be of interest to determine the effect of this procedure on the electroencephalogram (EEG). A total of 24 S's were used in the investigation, 8 in the experimental (thyroid-feeding) group and 16 in the control group. EEG records were taken before and after a standard period of thyroid feeding in the experimental group, and parallel determinations were made by Himwich and assistants of basal metabolic rate and brain-oxidation rate. Analysis of records by conventional procedures to determine alpha index and frequency failed to show any appreciable or consistent change in either property following thyroid feeding. This is noteworthy in view of hypotheses advanced in the literature that alpha frequency is an index of cortical oxidation rate. A more elaborate method of analysis, in terms of electrical energy represented by waves of different durations (range from 1/30 to 1 second), showed, on the contrary, a marked change in the energy distribution following thyroid feeding. The significance of these results with respect to possible use of the EEG as an index of cortical oxidation rate and its bearing on the clinical changes produced by thyroid feeding will be discussed. This study was assisted by a grant-in-aid from the American Philosophical Society. [15 min., slides.]

INTELLIGENCE TESTS

Program Arranged in Collaboration With the American
Association for Applied Psychology

Friday, September 5, 1:15 P.M.

Room 100, Speech Building

R. S. WOODWORTH, Chairman

1:15 P. M. *Some Theoretical Issues in Adult Intelligence Testing.* RAYMOND B. CATTELL, Clark University.

Owing to the war the problem of adult intelligence testing has again moved into the limelight, yet the growth of a satisfactory theoretical basis, generally agreed upon by psychologists, has advanced hardly at all since the testing of 1917.

A review of the chief practical trends in adult intelligence testing since that date is presented. There are certain radical differences between child and adult intelligence measurement which introduce special difficulties into the latter. Chief among them is the separation of power and speed. It is suggested that this may need to be handled by new concepts rather than new technical devices.

Secondly, it is possible that the distribution of adult intelligence diverges from that found among children. The relative advantages and disadvantages of the Intelligence Quotient and other means of expressing intelligence measurements are weighed. It is demonstrated that there has been a continuous trend towards accepting larger standard deviations as representing the true dispersion of intelligence quotients. The extent to which this depends on the nature of the test is discussed in relation to adult measurement.

Fundamentally important differences of opinion among psychologists concerning the nature of adult intelligence still exist. Factor analysis promised to terminate the arbitrariness of definitions, but has only partially succeeded, by shifting arbitrariness further back to the basic concepts behind the process of analysis. The notion of a general factor does not recommend itself so strongly in adult testing because adult tests are less saturated with a general factor. Thurstone's and Thomson's alternatives are discussed, and a practical solution suggested. [15 min.]

1:35 P.M. *A Comparison of the Complete and Abbreviated Stanford-Binet and of Clusters of Items Within the Test for Adult Offenders.* I. LEON MAIZLISH, Diagnostic Depot, Division of the Criminologist, Joliet, Illinois.

Psychologists have tested the intelligence of adult offenders with abbreviated Stanford-Binets and cited group differences in IQ. This study examines the adequacy of an abbreviated scale and presents data of group differences in clusters of items within the test.

The IQ's of 120 subjects were calculated for both the complete and

abbreviated Form L. Large discrepancies suggesting clinical situations where abbreviated scales are misleading will be discussed. The data on group differences are based on approximately 1200 Stanford-Binets administered between 1933 and 1941. The extent, and effect on IQ, of such clusters as the vocabulary items have been statistically evaluated for native white, negro, foreign-born, and groups committed for particular types of offense. Group differences in passing items which clinically appear unsuited for testing adults will also be cited. [10 min.]

1:50 P.M. *Clinical Evidence Concerning the Nature of Normal Adult Test Performance.* D. O. HEBB, Queen's University.

A comparison is made of test-score patterns in (a) cases of mental deficiency due to birth injury, without gross motor handicap, and (b) cases of injury to the adult brain reported in the literature or observed at the Montreal Neurological Institute. It appears that certain test abilities are less affected by late than by early injury. Certain kinds of verbal comprehension, for example, are depressed by birth injury, but retain a more nearly normal level after injury at maturity; for other tests the time of injury is less important. In view of animal experiments showing that late injury to the brain has no less serious effect physiologically than early injury, it is inferred that the development and the retention of certain modes of behavior are not dependent on the brain in the same way—that is, the development of some abilities demands an intact brain, while their retention does not.

If this is confirmed, the data suggest that the functioning of adult intelligence involves persistent qualitative modifications of behavior (due to the intellectual processes that have occurred during development); that it is partly on these qualitative aspects that a rating of intelligence is based; and, accordingly, that the level of adult test performance is a function of the kind of intellectual activity that has gone on during development, as well as of the present status of the cerebrum.

The hypothesis is based on clinical evidence that is not wholly conclusive, and animal experiments are being undertaken to test it. [15 min., slides.]

2:10 P.M. *The Revised Stanford-Binet Scale Viewed as a Point Scale.* C. H. GROWDON, Bureau of Juvenile Research, Columbus, Ohio.

This paper deals further with the concept advanced by the writer in a paper presented before the Intelligence Tests section of the A.P.A. on September 6, 1940, in which it was held that the revised Stanford-Binet Scale is in fact a point scale and that it could be used much more satisfactorily if applied as such (see *Psychol. Bull.*, 1940, 37, 512). The possibilities of a more effective relocation of the test items have been canvassed, certain items have been placed in new locations, and a point scale has been set up. The results obtained by the use of this point scale have been carefully compared with the results obtained by the original scale, Form L, in the cases of 440 children between the ages of 8 and 18 years. The findings indicate a saving of approximately one-third of the time required in testing, a material reduction in scatter, and a final rating which is very

close to that of the original scale. The correlation between the IQ ratings by the use of the point scale and those obtained by the standard method of Form L is .97 with a P.E. of .002. [15 min.]

2:30 P.M. *Children With Inferior Social Histories: Their Mental Development in Foster Homes.* HAROLD M. SKEELS, University of Iowa.

The purpose of this study was to investigate the mental development of children with known inferior social histories who were placed in adoptive homes in infancy and to consider the relationship between the mental development of the children and factors characterizing the true and foster parents. Three groups were studied: one group of 87 children whose mothers were mentally retarded, with intelligence quotients of 75 or less; a second group of 111 children whose fathers were unskilled or slightly skilled laborers; and a third group of 31 children who were included in both of the above groups, their mothers being mentally retarded and their fathers being classified low occupationally.

Conclusions may be summarized as follows: (1) Children of mothers with low intelligence or from fathers with low occupational status or from a combination of both, placed in adoptive homes in infancy, attain a mental level which equals or exceeds that of the population as a whole. (2) The frequency with which cases showing mental retardation appear is no greater than might be expected from a random sampling of the population as a whole, and the frequency with which cases having superior intelligence appear is somewhat greater than might be expected from a random sampling of the population. (3) Low intelligence of the true mothers or low occupational status of the true fathers or a combination of both should not be considered as a deterrent in the placing of infants in adoptive homes.

The writer wishes to acknowledge the major contribution of Miss Irene E. Harms in the compilation and analyses of available data. This was done in connection with her thesis submitted as partial fulfillment of the degree of Master of Arts at the State University of Iowa, 1941. [15 min.]

2:50 P.M. *Seasonal Variations in Mental Growth.* HAROLD E. JONES, University of California.

In a study of 700 mental tests of nursery school children, greater IQ gains were found from fall to spring than over the summer period from spring to fall. Similar results from the University of Iowa have been interpreted as due to the effects of nursery school training during the winter period.

The Iowa hypothesis has been examined in (a) comparison of summer gains for children attending, and not attending, a summer nursery school; (b) comparison of cumulative records for children remaining in, and leaving, nursery school; (c) analysis of seasonal variation in 532 tests of non-nursery school children. The results do not support theories of environmental influence in the nursery school. Alternative hypotheses are discussed. [10 min., slides.]

3:05 P.M. *A Test for Measuring the Mentality of Infants.* A. R. GILLILAND and J. J. B. MORGAN, Northwestern University.

Twenty-five infants at the Evanston Cradle have been given a battery of tests each week from 1 to 12 weeks of age. Another group have been tested from 7 to 12 weeks. Twenty-four different tests were used. They were adaptations from Gesell, Buehler, and Shirley, together with almost as many new tests. They were selected as measures of adaptive behavior rather than measures of reflexes, or physical growth. They include (1) visual regard, (2) development of vocalization, (3) orientation to noise, (4) adaptation to cold and pain, (5) development of reaching, grasping, and exploring, and (6) adaptation to restricted breathing.

Charts and tables were constructed for performance on each test showing progressive changes from week to week. Three methods of validating the tests are being used: (1) improvement on test performance with age; (2) comparison of records with Mongolians, hydrocephalic and cerebral hemorrhage cases of similar age who are definitely feeble-minded; (3) comparison with scores made at later ages on Cattell, Gesell, and Stanford Revision tests.

Upon the basis of present results a tentative test of the Binet type has been constructed for use at the 4-, 8-, and 12-week level.

Anna Shotwell coöperated in the study. [15 min., slides.]

3:25 P.M. *A Comparative Study of the Intelligence of Jewish and Scandinavian Kindergarten Children.* FRED BROWN, Child Study Department, Minneapolis Public Schools.

In this study we attempted to answer the following questions: (1) Are there differences in the general average mental level of Jewish and Scandinavian kindergarten children? (2) Are there subtest differences between the two groups? (3) Does socioeconomic status affect the test scores of members in each group to the same degree? (4) If differences are found, how would they compare with popular notions of the intellectual characteristics of each group? (5) Do cultural influences affect test results at this age level?

Three hundred and twenty-four Jewish and 323 Scandinavian children were given the 1916 Revision of the Stanford-Binet Scale by certified teacher-testers as part of the Kindergarten Binet Testing Program of the Minneapolis Public Schools. Age, sex, and socioeconomic status were rigidly controlled. No speech defectives or other atypical children were included in the experiment.

No significant differences in IQ, basal age, chronological age, or vocabulary score occurred between the two groups.

No intragroup sex differences occurred when socioeconomic status was controlled.

Differences in general intelligence followed socioeconomic status in both inter- and intragroup comparisons.

Scandinavian IQ's were more variable than Jewish.

Scandinavian children surpassed Jewish on the Diamond and Ball and Field tests. Jewish children excelled in giving the date, naming coins, repetition of digits backwards, and comprehension.

An increase in the frequency of significant intergroup subtest trends followed the shift from higher (more assimilated) to lower (less assimilated) socioeconomic levels, favoring the Jewish groups. Cultural differences seemed to determine these differences. [15 min.]

PROJECTIVE TECHNIQUES

Friday, September 5, 1:15 P.M.

Room 104, University Hall

KURT LEWIN, Chairman

1:15 P.M. *Projective Techniques for the Study of Personality: A Critique.*
EVA RUTH BALKEN, Otho S. A. Sprague Memorial Institute and
University of Chicago.

First introduced in 1939 by L. K. Frank, the term Projective Techniques for the Study of Personality received an enthusiastic reception, and its application has reached astonishing proportions. Acceptance of the term has not been preceded by any investigation into its historical background nor by an analysis or definition in any precise manner. The term is applied to techniques and tests devised from totally unrelated points of view and in the service of a variety of ends, including the therapeutic. Claims are made concerning the great advances achieved with such techniques and also regarding the vigorous exploration and experimentation to which these techniques are being subjected. Use of the term is acquiring a despotism which must always challenge the criticism of unbiased psychologists and indicates that an historical perspective, definition, and analysis are essential if the term is to be accepted as one of the major categories in the field of personality.

The present article attempts such an analysis through an examination of techniques and tests now being catalogued as Projective Techniques. The criticisms raised therein do not affect the validity of research with "projection techniques," but merely express skepticism concerning the usefulness of the term and concerning the enormous superstructure of interpretations and claims being erected thereon. [15 min.]

1:35 P.M. *Adolescent Phantasy.* PERCIVAL M. SYMONDS, Teachers College, Columbia University.

This is a preliminary report of a comprehensive study of adolescent phantasy material derived from stories obtained from 40 normal adolescents in junior and senior high schools, using 42 pictures of adolescents in a variety of social situations as stimuli. Additional information on each pupil was obtained by a variety of other methods.

The first aim is to discover what correspondence exists between themes in the stories and personality trends in the boys and girls. Each story is analyzed into its themes, and comparison is made with personality trends as shown by other evidence.

In every case analyzed the themes shown in the stories are different

from, and even the opposite of, trends in the manifest personality. From the point of view of education the stories reveal unexpressed possibilities in character, and from the point of view of personality the stories reveal underlying unconscious motives and drives. [10 min.]

1:50 P.M. *Pseudopsychotic Reactions in Rorschach Records of Preschool Children.* BRUNO KLOFFER, Teachers College, Columbia University.

Concept formations showing marked disturbance of the logical functions have been considered characteristic for the Rorschach records of psychotic subjects. Some of these, especially one named "contamination," had never before been found in the records of nonpsychotic subjects and therefore considered pathognomonic. In a preliminary report at the Eastern Psychological Association meeting in Brooklyn, New York, the discovery of such reactions and their occurrence in one group of 20 nursery school children has been reported. The investigation is being extended to a collection of over 200 records from various nursery schools in order to determine the extent to which such reaction patterns occur and to investigate the qualitative difference between such pseudopsychotic reactions of preschool children and genuine psychotic reactions of adult patients. [10 min.]

2:05 P.M. *Concept Formation Tests and Personality Research.* D. RAPAPORT, Menninger Clinic, Topeka, Kansas, and J. F. BROWN, University of Kansas.

Theoretical considerations based on investigations using different methods of testing concept formation are offered in an attempt to assign a place in personality research to these methods.

The similarities and opposites items used in standard intelligence tests were aimed to test the conceptual level of the subject. Gelb and Goldstein, in their investigations on brain-injured subjects, introduced testing methods (Weigl and B. R. L. Tests) which revealed in these subjects an impairment of "abstract behavior," an impairment essentially of the concept-forming ability. To investigate the thinking of schizophrenics, Vigodsky adopted the method of Ach (Hanfmann-Kasanin Test), which tests the ability of creating new concepts.

The interrelation of these three methods of testing concept formation is discussed. The similarities-opposites method is shown to test the verbal, stereotyped level of concept formation which, as an empty shell, may survive after active concept formation has been impaired. The B. R. L. method tests reproductive concept formation as reflected in grouping familiar objects. In the Hanfmann-Kasanin Test concept formation is tested in a problem-solving situation requiring the formation of a new concept.

An investigation is reported using these three methods to test the concept formation of psychiatric patients and of normal controls. Although the quantitative scores of normals, neurotics, and psychotics show an overlapping, there are discernible differences between these categories in quality and pattern of performance, which were found to indicate

clinically observable differences in mode of thinking related to differences in personality structure.

This application of the psychology of thinking to individual differences is discussed in reference to its significance for personality research. Thus, results of the psychology of thinking become clinically useful, especially where the difficulties of concept formation are accompanied by a frustration-situation, reflecting the relation of emotional and conceptual difficulties, as in the Hanfmann-Kasanin Test. [15 min.]

2:25 P.M. *Pubescence and Personality*. MARGUERITE R. HERTZ, Western Reserve University.

In a preliminary study based on the Rorschach Method report was made of personality changes in 35 girls in various stages of pubescent development, examined at 12 and 15 years of age. The hypotheses formulated were subjected to further research with 80 twelve-year-old and 100 fifteen-year-old children.

The five patterns of emotionality (M, Sum C, FC -(C+CF), M - Sum C, M + Sum C), studied in the larger groups classified according to pubescent status, exhibited trends many of which were reliably established statistically, substantiating the earlier findings.

At 12 years prepubescents within a year of puberty exhibit more inner living, less emotional responsiveness, but greater stability than girls further removed from the pubertal crisis.

More pubescents than prepubescents show contraction of the personality with suppression of inner living, but with emotional persistence in clinging to the outer world and greater emotional stability, this last retreating the tendency observed in the preliminary study.

At 15, pubescents mature for 1 to 18 months, are more introverse and less emotionally responsive to the outer world than more mature girls. The most mature groups are more expansive, highly sensitive to environmental influences, and more stable emotionally.

Comparing 12- and 15-year-old girls of like pubescent status (within 1 to 24 months of the menarche), older pubescents are reliably more introverse and expansive, and less stable emotionally.

It may be concluded that *constriction* is a pubertal pattern of chronologically early maturity, *introversiveness* characteristic of late puberty, and *dilation*, of postpuberty. Contrary to earlier findings, attainment of late puberty is accompanied by heightened emotions. Personality changes discernible within the age range 12 to 15 years should be viewed as evidences of general maturity, development due to the interaction of age, physical change, social experience, and pressure from the social world without.

Elizabeth Baker collaborated in the preparation of this report. [15 min., slides.]

2:45 P.M. *A Technique for Inquiry Into Individual Personality*. SYVIL MARQUIT, Brooklyn Child Guidance Clinic.

Following an idea suggested by Binet and apparently unused since, a technique of examining personality attributes of individuals has been de-

vised. The method consists of a "test" of eight simple questions presented orally. Each question relates to a common human activity and was designed to permit a subject much freedom of response.

The wide variety of answers from different subjects affords a basis for differentiating individuals. Interpretations of personality attributes are based on an analytic method similar in underlying assumptions to that used with the Rorschach test. [10 min.]

3:00 P.M. *A New Technique for Classifying Free-Association Responses.*
JOHN W. STAFFORD, Catholic University of America.

Previous classifications of the responses given in the free-association test have been largely subjective; moreover, the assumption has been made that the stimulus-response bond as judged by the classifier is the same type of bond that had been operative when the original subjects gave the response.

In this study stimulus-response couplets from free-association tests were presented to 30 subjects untrained in psychology who connected the two words in a simple, spontaneous sentence. The materials used were 300 couplets from the Kent-Rosanoff lists and 700 couplets from an original test (75 subjects).

In attempting to classify objectively the relations in 18,750 sentences analyzed, 35 different types of relations between stimulus and response words were found. However, 48% of the couplets fell into only three categories: 29.4% were "qualifiers"; 10.3% were "coördinates"; 8.3% were "spatial relations." Each subject gave more qualifiers than any other relation; a large majority had coördinates next; close to half had spatial relations third. An incidental result of the investigation is an objective criterion for "speech-writing connections": frequency of identical expressions. A list of such connections is provided for further research, notably on the law of effect.

As a final test of the technique, the stimulus-response couplets were presented for classification to "experts,"—subjects trained in psychology. These subjects gave more "sophisticated" and "logical" classifications. Hence it is concluded that the "sentence method" of analysis described here reveals more clearly the actual connections operative in the subjects who formed the original associations.

To explain the distribution of "qualifiers," "coördinates," "spatial relations," etc., obtained above, a theory of association is suggested in which "degree of integration" between the two words associated determines the strength of the association. [15 min.]

PERSONALITY II

Saturday, September 6, 9:00 A.M.

Room 100, Speech Building

JOHN ANDERSON, Chairman

9:00 A.M. *Personality Correlates of Alcoholic Beverage Consumption.*
THEO. F. LENTZ, Washington University.

This paper will report points of differentiation revealed by a comparative study of moderate drinkers and total abstainers. These differentiations were found in terms of attitudes, opinions, and interests and will be reported both specifically and generally.

Also reported will be the development of a preliminary test of drinker psychology or drinker prediction, consisting of the differentiating items revealed by the contrast. Seven hundred and eighty young adults were scored on this test, yielding a reliability coefficient of .69. Ninety-five of the 100 persons receiving the highest test scores were drinkers, and 75 of the 100 persons receiving the lowest scores were nondrinkers.

Close correlation was discovered between smoking and drinking. Drinkers were found to be more self-conscious and less self-confident than nondrinkers. Nondrinkers revealed themselves as happier and more optimistic, but less tolerant, than the drinkers.

The author wishes to express his appreciation for the valuable assistance rendered by Robert Randel, research assistant in the Character Research Institute. [15 min.]

9:20 A.M. *Evidence for Repression and Rationalization in the Solution of a Moral Conflict.* DAN L. ADLER, University of Iowa.

To test the hypothesis that guilt feelings lead to repression and/or rationalization, the following technique was used:

Thirty-seven subjects rated 12 activities on a five-point continuum, indicating those they liked, found neutral, or disliked. One liked and one disliked activity were presented together to the subject, who chose one of the activities for himself to do and set the other aside for a non-present partner to do later. Each subject made four such choices. After completing the chosen activities, subjects were asked to recall as many as possible of the 12 activities originally presented. Then, with all activities in sight, subjects rerated them on the scale described, indicating which they disliked and liked now, and which the "general population" liked and disliked.

Choices were designated "selfish" when the subject kept and did the activity which he liked, leaving the disliked activity for the partner. When the disliked activity was kept, and the liked activity left, the choice was designated "generous."

Pertinent results include: (1) Ninety-two per cent of all choices were selfish; 73% of the subjects made all selfish choices. (2) Forty-four per cent of the neutral activities were not recalled. Sixteen per cent of the activities involved in selfish choices and 4% of activities involved in generous choices were not recalled. (3) As many kept (performed) activi-

ties were forgotten (13%) as given (nonperformed) activities (17%). (4) There were no significant changes from the subject's first to second rating of his own likes and dislikes. (5) The "general population" rating of *disliked activities left for the partner* was higher than either of the subject's own ratings of these activities. (6) The "general population" rating of *liked activities kept for himself* by the subject was lower than either of his own ratings of these activities. [15 min., slides.]

9:40 A.M. *Analysis of the Rater-Effect in Personality Evaluation.* T. W. RICHARDS, Antioch College.

No one who uses rating scales would challenge the position that the rater's personality is extremely important in determining the nature of the ratings. The concept of halo effect has become classic. Yet there has been very little analysis of the nature of the halo or other rater-effect. How much does the evaluation of one variable reflect the personal and unique psychology of the rater, over and above the true behavior of the ratee?

To answer some of these questions, the ratings of two raters on the same group of children were compared by means of the factor patterns they yielded. This comparison was made for three different pairs of raters. The scales used were developed for teachers in the elementary classroom and were designed to measure neatness, impulsiveness, distractibility, emotional control, dominance, sensitiveness, restlessness, emotional reactivity, fatigability, energy, interest, and misbehavior.

Each comparison of two raters for the same children showed that the raters had similar concepts to some extent. There were important differences, however. In one case Rater 1 considered "sensitiveness" related to a configuration of misbehavior or undesirableness, while the second rater considered it to share a component of emotionability. In another case the two raters agreed that there was a factor of energy, endurance, and dominance; however, the first rater expressed a concept of emotionality and undesirable behavior, while the second rater broke up this factor into two orthogonal axes.

This material re-emphasizes the importance of the psychology of the rater and helps to elucidate the nature of the halo effect and similar phenomena of bias.

The writer wishes to acknowledge the help of Marjorie Powell, Rita Senf, and Margaret Slutz in developing the statistical basis for this report. [15 min., slides.]

10:00 A.M. *Personal Conflicts Indicated in Wishes of College Students.* GEORGE S. SPEER, Central Y.M.C.A. College.

An expression of wishes was obtained from 157 college students. The wishes were classified according to past, present, or future personal or external conflict situations. Six weeks later a second expression was obtained, and these wishes were compared with the first ones to determine the stability of the categories. Eighty of the students had written psychological autobiographies. The wishes of these students were compared with the autobiographical material to determine whether the conflicts

expressed in the wishes were also the problems discussed in the biographies. Each student was also rated for social adjustment. The results indicate that the average student is most consistent in the expression of "future external" and "present personal" wishes and that the maladjusted student is most consistent in the expression of "present external" and past or future "personal" wishes. [10 min.]

10:15 A.M. *A Comparison of Fraternity and Nonfraternity Populations With Regard to Certain Personality Characteristics.* WILLIAM M. LEFLEY, Pennsylvania State College.

The Adams-Lefley Personal Audit, a 9-part, 450-item instrument was administered to four student populations: fraternity men, nonfraternity men, fraternity women, and nonfraternity women. The size of the samples ranged from 100 to 163. A statistical analysis which yielded conventional critical ratios revealed that fraternity men and nonfraternity men are very similar with regard to the scores earned. A similar comparison of the two populations of women revealed two highly significant differences. Fraternity women were shown to be less susceptible to common annoyances. Furthermore, the fraternity women were shown to be more tolerant with regard to the idiosyncrasies of other persons. These and minor differences and similarities are to be discussed and interpreted. [10 min., slides.]

10:30 A.M. *Some Characteristics of a Group of Very Superior Children.* W. DRAYTON LEWIS, Murray State Teachers College.

The children with whom this report deals represent one in a thousand in ability, since they are the highest 50, as determined by the Kuhlmann-Anderson Test, out of 50,000 children in Grades 4 through 8. The data upon which this study is based were gathered by Coördinated Studies in Education, Incorporated, and include children from 310 communities in 36 states. The purpose of this study is to determine, within the limits of the data, the home backgrounds of the children and the adjustments which they have been able to make.

The homes from which these children come are slightly above the average for the total population from which this group was selected, but the most significant finding is that these very superior children can be anticipated at almost any socioeconomic level. Their homes range from those of poverty to those of superior circumstances, but most are distinctly middle class. Some of their fathers are factory workers and common laborers, some only slightly skilled workmen, and farmers. The skilled occupations and business and managerial groups are well represented.

These children appear to have developed desirable personalities in most instances and, when maladjustments are noted, they tend to be of the nonaggressive, withdrawing type. They are characterized as daydreamers, nervous, unhappy, moody, depressed, oversensitive about self, overcritical of others, suggestible, and inattentive. There is a tendency for the maladjustment to increase with an increase in ability. The effects of poverty appear to be very significant in causing maladjustment in these very superior children.

There is a distinct tendency toward educational retardation, many of these very superior children being educationally retarded even when compared with the total population. [15 min.]

10:50 A.M. *Some Personality Characteristics of Boys With Retarded Skeletal Maturity.* NANCY BAYLEY and MARY COVER JONES, Institute of Child Welfare, University of California.

The boys and girls in the University of California Adolescent Study have been classified into three groups for each sex, on the basis of age at reaching a given maturity of the bones of the hand and knee (assessed according to the Todd standards). Differences in rates of growth and in body proportions were found for several of the groups, the most generally deviate being the late-maturing boys. Between the ages of about 12 and 16 years, these late-maturing boys were found to average small for their chronological age, and to be long-legged and so proportionately to seem frail-bodied. However, for their skeletal age they tend to be average in most measures and slightly, though not significantly, above-average in height. As adults their relative height is maintained, while on the average they have proportionately narrow hips and broad shoulders. The critical ratios indicate significant differences between the early and late-maturing boys in bi-iliac/height and stem-length/height indices.

Some of the personality characteristics of this group will be discussed in terms of their interests, attitudes, abilities, and adjustments. These data are derived from psychological tests and ratings based on observations during a seven-year period.

Illustrative case material will present further examples of the possible effects of slow maturing upon personality development. [15 min., slides.]

11:10 A.M. *Consecutive Studies of Teachers' Dominative and Integrative Contacts With Elementary School Children and Related Changes in the Children's Classroom Behavior.* JOSEPH E. BREWER, General Education Board Fellow, and HAROLD H. ANDERSON, University of Illinois.

By means of consecutive samplings of teachers' dominative and socially integrative contacts with children simultaneously recorded with children's classroom behavior, certain aspects of the social interplay were analyzed.

Children's behavior was recorded in 29 defined categories, including social contributions, contributions to problem-solving, recitation responses, conforming, nonconforming, nervous habits, playing with foreign objects, dominating other children, whispering and other undetermined communications with other children.

The subjects were two groups of children with their respective second-grade teachers and the same groups of children the following year with different teachers in the third grade. Samplings of data were taken at midyear in the second grade and in the fall and again at midyear in the third grade.

The measures are able to reveal wide individual differences in the behavior of children and in the relation of the teachers to individual children

but also to delineate certain general patterns of behavior in the teachers' contacts with children as a group and general patterns of behavior in the groups of children.

In the second grade certain significant differences in the general patterns of teachers' behavior were associated with significant differences in the classroom behavior of children. When the children entered the third grade in the fall, the new teachers failed to show certain significant differences previously found in the second-grade teachers, and the children's classroom behavior showed significant changes in a direction consistent with the differences between second- and third-grade teachers.

In the midyear sampling of the third grade, the teachers showed certain constancy of pattern when compared with the fall sampling, but also certain changes that were again related to certain changes in the behavior of the children. [15 min., slides.]

11:30 A.M. *The Psychological and Educational Significance of Social Acceptability and Its Appraisal in a School Setting.* NORA LOEB, University of Toronto.

One of the major objectives of modern education concerns the nature of a child's social relationships. More specifically, the objective is expressed in terms of the effectiveness of the child's social participation or in terms of his social acceptability. In the present study, the social acceptability of children to their classmates is appraised. The technique used is an adaptation of Moreno's sociometric method. It requires the individual to choose people with whom he wishes to associate with respect to a given activity.

A test in accordance with this technique has been devised, and the results from 530 children in an elementary school show the test to be both reliable and valid. An investigation of the relationships between the results obtained and other variables deemed important in the school setting has shown that (a) acceptability to the classroom group is significantly related to school achievement; (b) it is but slightly related to chronological age, mental age, and intelligence quotient; (c) it bears meaningful and significant relationships to teachers' ratings on "undesirable" behavior patterns of children and to teachers' definitions of "problem" children.

Results indicate that the technique is sufficiently flexible to be functionally integrated into the modern school program. In so far as the educational objective evaluated and the technique of evaluation (a) emphasizes the importance of the activity of the whole child rather than his passive acquisition of knowledge, (b) measures the degree to which a present need rather than some future need is satisfied, and (c) allows for uniqueness in ways of meeting this need, it is compatible with the principles underlying modern educational objectives in general. Its significance as a measure of personality development is also indicated. [15 min.]

MENTAL MEASUREMENT

Saturday, September 6, 9:00 A.M.

Room 107, Harris Hall

JACK W. DUNLAP, Chairman

9:00 A.M. *Measurement of Performance-Consistency on Tests of Manual Dexterity.* JANET B. HARMON and LINDSEY R. HARMON, American Red Cross, St. Louis, Missouri.

Performance-consistency is a term denoting the precision of measurement of an individual case. It is defined in terms of the spread of scores on a series of trials about the mean of the series. The information it affords for the individual measurement is analogous to that afforded by the reliability coefficient for the average of a group. It may be expressed in absolute units or as a percentile. Derivation of this measure on the Minnesota Placing and Turning Tests is described, including correction for practice and the skewness inherent in time scores on work-limit tests. Clinical and experimental uses, extension of the method to other tests, and data derived from application of this method of analysis are presented, along with a mimeographed form developed to facilitate calculation of mean score and performance-consistency on the Manual Dexterity Tests. [10 min.]

9:15 A.M. *The Relative Efficiency of Three Types of Factorial Design.* WILLIAM E. KENDALL, University of Minnesota.

In this report the efficiencies of three types of factorial design are compared. The data are from a motor task (tapping) at four levels of complexity, with restriction at two levels and pacing at two levels, providing 16 treatment combinations in a $4 \times 2 \times 2$ arrangement.

First, an unconfounded Latin Square with 16 blocks of four plots each was used. The efficiency factor (ratio of error root mean square to mean) was 1.42%. On duplication, a figure of 1.19% was obtained. Next, a balanced group of five sets was employed in which each factor and interaction was confounded once. The efficiency factor was of comparable magnitude. Last, three interactions previously found to be insignificant were confounded in an unbalanced arrangement.

In the experimental trials there is evidence to indicate that it is unsafe to assume that higher-order interactions may be neglected. [10 min.]

9:30 A.M. *Internal Consistency vs. External Validity in Item Analysis.* PHILIP H. DuBOIS, University of New Mexico.

Two investigations are reported in which item analysis by internal consistency is compared empirically with item analysis using an external criterion of validity.

In one study, 75 items on a self-description inventory relating to intellectual matters have been correlated with total scores on the inventory

and scores on the American Council on Education Psychological Examination.

In the other, 105 items on a civil service qualifying examination for employed social workers are correlated with total scores and with ratings supplied by the welfare agency.

Results are reported in terms of relationships between sets of biserial r 's and comparisons of the tests selected by each method. The theoretical basis of internal consistency is discussed. [15 min.]

9:50 A.M. *Some Neglected Aspects of Absolute Scaling Rationale.* MAURICE LORR, U. S. Civil Service Commission, and RALPH K. MEISTER, Mooseheart Laboratory for Child Research.

The method of absolute scaling explicitly assumes that the distribution of ability in the groups scaled is normal, and it permits dispersions to vary from group to group. Implicitly the technique assumes that the test items or elements remain invariant from one interval of ability to another with regard to validity or factorial composition. However, this last assumption cannot be satisfied, for it has been shown that test items or elements do, in fact, vary markedly in validity with changes in ability. Every item or test element has a maximal differential validity for a specific ability interval. Accordingly, this paper is an attempt to relate these facts to absolute scaling rationale and to show that (1) the unit of the absolute scale is necessarily a function of the item validities; (2) changes in absolute variability with goodness of performance result from changes in the validities of the items scaled.

These considerations apply to both the population percentage scaling method (Thurstone) and the score percentage scaling method (Woodrow) and to the results of studies using these methods. Thus the characteristics of the mental growth curve derived by absolute scaling, since they depend upon the units used, are thereby determined by the particular item composition of the test. Similarly, the linear increase of absolute variability with mean test performance and the determination of an absolute zero of test intelligence by extrapolation to a point of zero variability are also dependent upon the differences in item validities.

Indications are that these and other results obtained by the use of absolute scaling methods are predetermined by the item composition of the test and that with a different distribution of item validities different and even opposite results may be obtained. Instances from the literature are cited. [15 min.]

10:10 A.M. *Regression Fallacies in the Matched-Groups Experiment.* ROBERT L. THORNDIKE, Teachers College, Columbia University.

A familiar experimental pattern in psychology is that using matched groups. Matching is designed to eliminate both the systematic and the chance effect of certain variables irrelevant to the main question at issue, thereby increasing the sensitivity and the validity of the statistical result.

When the matched groups are samples from the same total population, the only problem which arises concerns the appropriate formula for determining the standard error of observed differences. It is always

necessary to take account of the reduction in chance error due to the process of matching.

When the matched samples are not chosen from the same population, however, additional problems arise. These become important in so far as the populations differ in their average score in one or another of the factors being studied. If samples are matched in two (or more) populations which have different population means in the measure used for matching and these samples are then studied with regard to some other measure, the samples will, in general, not be matched on the other measure. The samples will be expected to differ on the second test by an amount which is a function of: (1) the difference between the population means in the first measure, (2) the difference between the population means in the second measure, (3) the variabilities of the two measures, (4) the correlation between the two measures. This effect is apart from, and superimposed upon, any effects produced by the experimental procedures. It arises purely from the manner of selecting the cases.

These regression effects will be illustrated with both artificial and empirical data. Formulae will be presented for estimating the amount of the effect when matching is based on one or more measures. Practical expedients for taking account of the regression effect will be suggested. [15 min.]

10:30 A.M. *Derivation and Application of a Unit Scoring System for the Strong Vocational Interest Blank for Women.* BERTHA M. PETERSON and JACK W. DUNLAP, University of Rochester.

The test was administered to 551 women students of the classes of 1940 through 1943 at the University of Rochester, of whom 328 were selected in a random manner to serve as an experimental group; the remaining 223 formed the control group.

Scores were obtained for all individuals using Strong's scoring system with weights ranging from +4 to -4, and at the same time scores were derived using a system of unit weights. For the 14 occupations studied, correlations between "original" and "unit" scores for the experimental group ranged from .951 to .986.

From these correlation coefficients, regression equations were constructed for each occupation for predicting "original" scores from a knowledge of the "unit" scores. Applying these equations to the "unit" scores of the control group, estimations in letter grades were made of the true or "original" scores. Correlations between these predicted values and the actual values for the various occupations ranged from .919 to .973. A study of the deviations that occurred between predicted and actual ratings revealed that 703 out of 3122 scores, or 22.5%, shifted a half letter grade, and only 28, or 0.9%, shifted a whole letter grade. In the critical area in terms of giving advice to subjects, only one case in 50 was changed.

In view of the expected adaptation of the test to machine-scoring, these results mean that it is practicable, with relatively slight losses in accuracy, to take advantage of the substantial saving in time and effort which the unit scoring system makes possible. [15 min., slides.]

10:50 A.M. *Interest Patterns of Good and Poor Dental Students: A New Scoring Key for the Strong Vocational Interest Blank.* ROGER M. BELLOWS and MARTIN D. KAPLON, University of Maryland.

The Strong Vocational Interest Blank is widely used for counseling students who desire training in professional schools. However, scores derived from the Strong key for dentistry have not been found useful as an aid in estimating probability of success in the dental school situation. This investigation was designed to obtain scoring weights for those responses to the items of the Strong Blank which significantly differentiated the upper 27% from the lower 27% of the dental students used. Scoring key weights were determined by the Kelley-Strong method. Four samples, comprising 260 male subjects, were employed.

Following the suggestion of J. W. Dunlap, scores were obtained by a simple key with +1 and -1 weights and were found to correlate highly ($.96 \pm .01$) with scores for the same item-responses obtained by a key with detailed weights ranging from +5 to -5. It is recommended that the simpler procedures be carefully considered in scoring of this kind since they were found to be as useful as the more detailed techniques and are easier to develop and more economical in use.

The keys were tested for their utility on the original samples and criteria used in their development, on subsequent or follow-up criteria for the same samples, and on criteria for additional samples. Of several keys developed with simple weights, one is presented and recommended for trial by those interested in experimenting with measures of aspects relatively unrelated to the usual predental aptitude and achievement records. This key was found to have acceptable forecasting efficiency in most of the situations in which it was used.

Acknowledgment is made to Jesse T. Fontaine, Jr., and John S. Thatcher, who participated in the investigation. [15 min.]

11:10 A.M. *The Relation of Fine and Gross Motor Abilities.* HAROLD SEASHORE, Springfield College.

In coöperation with physical educators, analysis is being made of the structural factors and motor abilities which underlie skill in athletics and other gross muscular activities. Part of a larger project, this research is concerned with documenting the relationships of fine and gross motor abilities.

Two samples of 100 freshman men have been measured on an extensive battery of standard and original tests, mainly involving dynamic coördination rather than sheer strength. The results are reported in three forms:

(A) Tables of zero-order intercorrelations. As predicted, but here documented for the first time, the intercorrelations between fine and gross abilities are low, the median r being about .35. There is no significant relationship between abilities which involve finer adjustments of segments of the body and the grosser handling of the whole body as in athletic activities.

(B) Comparison of two criterion groups, superior athletes and non-athletes, by critical ratio technique and coefficients of biserial correla-

tions. Two studies, involving different students and different test items, yield the same essential result. There is no significant difference in scores on tests of fine motor abilities between these two groups with known differences in gross (athletic) abilities.

(C) Factorial analyses of the sets of data permit further interpretation of the abilities measured by the items in the batteries.

The findings are discussed in terms of the whole project and other pertinent researches. [15 min., slides.]

PERCEPTION

Saturday, September 6, 9:00 A.M.

Music Hall Assembly Room

WALTER R. MILES, Chairman

9:00 A.M. *The Effect of Interpolated Stimuli on the Time Error in Judgments of Vertical Distance.* C. W. CRANNELL, University of Michigan.

Subjects were required to judge the difference in vertical distance between pairs of dots projected on a screen. Intervals of 2 to 16 seconds elapsed between the first and second pairs of dots. In separate experiments other pairs of dots, either twice as far or half as far apart as the principal pairs, were exposed during the intervals. In control experiments the intervals were left without stimulation.

In all experiments a negative time error was obtained, which was much stronger with larger than with smaller interpolated vertical distances. No consistent effect of the length of interpolated interval was observed.

Although these results seem contrary to theoretical expectations and certain previous experiments, examination of various types of experimental material and of the methodology of time-error experiments affords a consistent explanation. [10 min., slides.]

9:15 A.M. *The Accuracy of Judgments of the Direction of Regard.* JOHN M. MCGINNIS, Hollins College.

This investigation was undertaken to determine the degree of accuracy with which one can judge the direction in which another person is looking and to ascertain some of the conditions which influence the accuracy of this judgment. The results are based on over 3600 judgments made by 40 subjects.

The average error of judgment varies with the angular distance between the "judger's" head and the point on which the "looker's" gaze is fixed. Accuracy also varies in the vertical, horizontal, and diagonal directions from the "judger." Constant errors occur and will be discussed along with certain other influences on the accuracy of the judgments made.

The author acknowledges important suggestions by Professor Ray-

mond Dodge and the assistance of Mary Coleman Hankins and Jane Sutherland in collecting and tabulating the data. [10 min., slides.]

9:30 A.M. *The Reversal of Simultaneous Contrast.* SIDNEY M. NEWHALL, Johns Hopkins University.

The familiar result of comparing identical gray figures on adjacent black and white grounds is for the gray figure on the black ground to appear lighter while the gray on the white appears darker. With the simple figure-ground relations of the usual laboratory demonstration, this classical contrast effect is so regular and predictable that a qualitative departure from it comes as a surprise. Several of our subjects consistently reported a reversal of the established effect—that is, for them, the gray figure on the black ground was relatively the darker. Comparative observations indicate that this reversed effect is restricted to certain types of figures as well as to certain subjects. The present purpose is to describe a preliminary investigation of the conditions underlying the phenomenon. [10 min., slides.]

9:45 A.M. *The Effects of Quality and Intensity of Illumination and Reflectance of Background on Lightness and Saturation as Shown by Analysis of Variance Technique.* HARRY HELSON, Bryn Mawr College.

Having previously established that quality and intensity of illuminant and reflectance of background affect hue, lightness, and saturation of samples according to laws based on single-variable statistical analysis, data were treated by analysis of variance methods in order to discover if any additional factors were operative, particularly second-order interactions. The F value for the interaction of quality and intensity of illumination is not significant so far as their interacting effect on saturation goes, but the F value for composition of illuminant and reflectance of background is so much larger than the value at the 1% level that we can be sure these variables interact. The F value for backgrounds and intensities lies just inside the 5% point and is of doubtful significance. Differences in saturation are all highly significant except for the red and green illuminants used in this study, as shown by the t-test. The order of decreasing saturation is from yellow, through red, to green, to blue. Three of six comparisons are highly significant in the effect of intensity on saturation, one is doubtful, and two are not significant. The differences between the three backgrounds are all significant, showing background exerts decisive influence on saturation under our conditions of experimentation.

Results of F and t-tests for the effects of quality and intensity of illuminant and reflectance of background on lightness will also be discussed and related to certain general principles of visual functioning. [15 min., slides.]

10:05 A.M. *Facial Vision: The Perception of Obstacles by the Blind.* KARL M. DALLENBACH, Cornell University.

The following experiments, conducted by Michael Supa, a blind stu-

dent, and Milton Cotzin, were undertaken to determine how the blind perceive and avoid obstacles.

Four subjects were used: two blind and two with normal vision. All were blindfolded and instructed, after being placed at varying distances from a wall, to walk forward and to stop when they sensed the presence of the wall, and then to move as close to it as possible without touching it.

The first three series, 50 trials each, were exploratory. In the first, the wall was stationary and *S* started walking toward it from varying distances; in the second, *S* started from a given station, and the wall was placed at varying distances away; and in the third, *S*'s station and the position of the wall were both varied. All the *S*'s, the blind immediately and the blindfolded very soon, were able to detect the presence of the wall and to approach it within a few inches without touching it.

In the experimental series, which then followed, various sensory cues were eliminated. In Series 4, all of the cutaneous areas were covered by heavy felt to eliminate any pressure by air waves. The *S*'s still detected the wall. In Series 5, audition alone was eliminated by the use of ear plugs. All the *S*'s failed to detect the wall and ran into it on every trial. In Series 6, the *S*'s wore ear phones actuated by an electrically driven tuning fork of 1000 cycles. Under the influence of this sound screen they were again unable to detect the wall. Audition thus seems to be the only essential cue to the perception and avoidance of obstacles by the blind. [15 min.]

10:25 A.M. *Perceptual Size-Constancy in Life Situations.* EGON BRUNSWIK, University of California.

A sample of 93 frontal objects of various sizes and distances representative of perceptual situations in everyday life was secured by obtaining from a subject, at irregular intervals during normal activities, reports of the incidental perceptual contents. Immediate perceptual estimates (as well as critical ones) of object-size (distal stimulus), visual angle (proximal, "retinals," stimulus), and of distance were given by both subject and experimenter. The latter also secured the corresponding objective measures. The sizes range from a few mm. to more than 100 m. and show a normal distribution when plotted logarithmically, and the distances range from 25 cm. to about 1500 m.

Perceptual estimates show, on the whole, much better agreement with the corresponding stimulus variable when this variable is distal object-size (indicating good perceptual size-constancy), or when it is distance, than when it is proximal size (supporting evidence against the "constancy-hypothesis"). Various correlations computed between the estimates and the environmental variables after elimination of the environmental correlation between object-size and retinal size are between .95 and 1.00 in the case of object-size and of distance, and between 0 and .7 when retinal size is involved, with good agreement between the coefficients representing the perceptual achievements of the two observers. Averages of errors follow a similar pattern.

The generality of further findings of laboratory experimentation, such as the comparative overestimation of near objects (perceptual compro-

mise between distal and proximal size), and the improvement of estimates by shifting from the purely perceptual to the critically controlled attitudes was also demonstrated by our random sample of size estimates. There also is some indication of the relative independence of the distance functionally "taken into consideration" in the establishment of size-constancy, and the explicit ("conscious") estimates of distance.

Overestimation of vertical as contrasted to horizontal extensions was not borne out by our data. [15 min., slides.]

LEARNING IN ANIMALS

Saturday, September 6, 9:00 A.M.

Room 104, University Hall

JOHN F. DASHIELL, Chairman

9:00 A.M. *Habit Fixation and So-called Regression in the Rat.* ROBERT WATSON KLEEMEIER, University of Michigan.

Studies of regression in animals have characteristically used a two-choice situation in which the animal is first trained to one alternative, then to the other. Thus, shock at the choice point can have only two possible effects: the animal can go to the alley to which he has just been trained or to the alley to which he had been previously trained. In the latter case possibly the animal is merely discontinuing going to the alley to which he was most recently trained, rather than regressing to an earlier response.

To investigate the possibility that regression is an artifact of the situation, the plan of a unit of the T-maze was superimposed upon the plan of a unit of the Y-maze in order to have four alleys diverge from the choice point instead of two. Animals were allowed 50 free choices of alleys to determine natural preferences. Then the animals were trained successively in two habits, the first to a preferred alley and the second to a non-preferred alley. Different groups of animals were trained in different combinations of alleys in order to cancel out spatial factors influencing the choice.

The results seem to show that if the choice after shock is not a continuation of the habit in progress, it is a new response determined by the needs of the immediate situation. This new response may be, in some cases, to the alley to which the animal had first been trained, but analysis of the data seems to indicate that this correspondence is coincidental.

Evidence that the shock produces fixation of response will also be presented. [15 min., slides.]

9:20 A.M. *Color Categorizing Behavior in Monkeys.* BENJAMIN WEINSTEIN, University of Wisconsin.

This study is a new development of the experiment described in "Matching-from-sample by rhesus monkeys and by children," *J. comp. Psychol.*, 1941, 31, 195-213. Two rhesus monkeys were trained to sort

out red and blue objects from among a mixed group of choice objects. In the course of the experiment, the red and blue objects were varied as to size, pattern, brightness, saturation, number, dimension, and background. In the generalization tests, sets of entirely new choice objects were used. Two specific differential cue-objects were employed throughout the experiment. The cue-object, which was consulted by the subject at the beginning of each trial, indicated either a red or a blue sorting response. The two cue-objects were alternated in random sequence, thus requiring the subjects to shift readily between the two types of sorting responses. The seven factors mentioned above were also varied in random sequence.

Applying the criteria of flexibility *vs.* stereotypy of behavior, a degree of lability of organized responses was secured here which has not been previously demonstrated in monkeys. Such flexible behavior was possible because of the ability of the subjects to utilize symbols, the cue-objects, as the basis for responses.

The conditions of this experiment were essentially similar to Goldstein's color-sorting tests with human subjects, upon which he bases his theoretical analysis of abstract or categorical behavior *vs.* concrete behavior. The relationship between this experiment and Goldstein's work is discussed. The terms sign, symbol, and concept are tentatively defined, and their application to the performances in this experiment is discussed.

The taming and tutoring techniques used are briefly described. The experimenter considers such techniques as crucial in securing complex adaptive behavior in experiments with infrahuman primates. [15 min.]

9:40 A.M. *Responses by Monkeys to Stimuli Having Multiple and Antagonistic Sign Values.* H. F. HARLOW, University of Wisconsin.

Four rhesus monkeys were trained to respond to stimuli having multiple and antagonistic sign values. This was accomplished by first training the subjects to solve matching-from-sample problems. Green wooden crosses and brass push buttons were used as stimulus-objects. Displacement of the sample-object was always followed by a piece of apple, and selection of the matching choice-object was rewarded with a piece of orange.

After this problem was solved the monkeys were trained to do nonmatching. In the nonmatching problem the sample-object was unrewarded, and the subject was required to select the choice-object which did not match the sample-object.

When this problem was solved the two tasks were presented in random sequence.

The subjects were next trained to form a discriminated-position-habit. The setup was the same as before, save for the fact that now the sample-object differed from both the choice-objects. If food was placed under the sample-object, the monkey was required to choose the right-position stimulus-object; when no food was under the sample-object, the subject was required to choose the left-position stimulus-object.

The discriminated-position-habit was then combined in random sequence with the matching and nonmatching problems.

Following solution of this task the monkeys were trained to solve a

reversed-discriminated-position-habit. In this situation all three stimulus-objects were identical.

When food was placed under the sample-object, the monkey was required to choose the left-position stimulus-object; when no food was under the sample-object, the subject was required to choose the right-position stimulus-object.

Finally, the four problems were combined in random sequence. This combined problem was mastered by all four subjects. [15 min., slides.]

10:00 A.M. *Negative Transfer in Delayed Reward Learning of Habit Reversals by Chimpanzees.* WALTER F. GREYER, Yale Laboratories of Primate Biology.

Recent work by Riesen showed that the capacity for delayed reward learning of nonspatial habit reversals was markedly greater in chimpanzees with concomitant training on similar stimuli (colored lights) in another experiment. The aim of the present experiment was a further analysis of conditions favorable and unfavorable to delayed reward learning.

Chimpanzees were trained to discriminate between pairs of colored lights or patterns, with the food rewards delayed for various intervals after removal of the stimuli. The apparatus and method were the same as have been described earlier by Riesen. In successive habits the same stimuli were used, and the animals trained to reverse the immediately preceding discrimination. This technique of repeated habit reversals, intended to simplify the training of the same animals in many habits, was found to result in a high degree of negative transfer. Whereas new stimulus pairs were readily discriminated under delayed reward conditions (8 seconds) by experienced chimpanzees, subsequent reversals and rereversals of the same habit were extremely difficult. Under immediate reward conditions this negative transfer was greatly diminished but still effective.

Since in Riesen's experiment all delayed reward training had been on habit reversals rather than new habits, his results merit reconsideration in terms of these later findings. The concomitant training received by his experimental group apparently had its most direct effect in dissipating the negative transfer, rather than in providing an otherwise lacking ability to bridge the delay interval. A greater facility in handling the delays may, nevertheless, have been the mechanism whereby the negative transfer effects were overcome. Several possible theoretical interpretations of the present findings are considered. [15 min., slides.]

10:20 A.M. *The Effect of Temperature on the Rate of Forgetting in Fish.* JOHN W. FRENCH, Princeton University.

This experiment was designed to determine the relation between the forgetting of a maze habit and temperature.

Goldfish were trained in a four-blind modified T-maze at room temperature. Learning to a criterion of five consecutive trials without entrance into a blind occurred after an average of 30 trials over a period of two and a half hours. Relearning to the same criterion was carried out on the four following days.

Immediately after learning on each day the members of one group

were warmed to 28°C, those of a second were cooled to 16°C, and those of a third were cooled to 4°C. They were allowed to rest at these temperatures alone and in the dark overnight. Before relearning, the fish were brought back to room temperature and given two hours to adapt to the change.

The number of blinds entered during the relearning period is taken as a measure of the forgetting. Forgetting was most rapid for the warm group. The medium group entered 28% fewer blinds than the warm group. The cold group entered 45% fewer. The difference is significant. The results suggest an exponential relation between forgetting and temperature.

The effect of the spontaneous activity of the fish during the rest intervals at controlled temperatures will be discussed. [15 min., slides.]

10:40 A.M. *The Gradient of Reinforcement in Maze Learning.* JOHN P. SEWARD, Connecticut College.

According to Hull's goal gradient hypothesis, the ease of eliminating a blind depends on the distance (or time) ratio between the alternative routes from choice point to goal. In the present study this ratio is varied systematically, and the effect on learning determined.

Four groups of rats are trained on a simple elevated T-maze with ratios of goal path to blind of 1:1, 1:4, 4:1, and 4:4. In each trial the actual time and distance from choice point to goal are measured.

Results to date indicate that length of goal path is a decisive factor in learning, the short-path groups showing marked superiority to the long. Length of blind appears less important. These results are discussed in the light of predictions from Hull's "reinforcement" and Tolman's "expectancy" hypotheses. [10 min., slides.]

10:55 A.M. *The Effect of Varying the Place of the Fractional Anticipatory-Consummatory Response Upon the Rate of Acquiring a Simple Learning Problem.* ROBERT HALL BRUCE, University of Wyoming.

Recent learning theories, such as those of Hull, Guthrie, and Tolman, have repeatedly emphasized the importance of the fractional anticipatory goal reaction in the learning situation. Previous work has demonstrated that a small portion of the reward, given before the task, will increase the rate of learning. This study was devised to determine the influence of the *place* of this fractional anticipatory-consummatory response upon the rate of learning.

Three groups of white rats were trained to drink for 10 days from the tube of an eudiometer. They were not allowed to wander in the field on which the eudiometer was placed. One group ($N = 14$) was run on the field with no preliminary water intake. Another group was given .5 c.c. of water by hand from an eye dropper before each daily run. A third group was allowed to drink .5 c.c. at the goal and then placed at the beginning of the field. Measures recorded were: (1) time to water, (2) excess distance, (3) time of first drink, (4) amount drunk.

Those animals drinking at the goal before the run took less time and

covered less excess distance to the goal than those animals having the preliminary drink by hand, and both of these groups of animals were faster learners than those animals with no preliminary drink. By the end of 14 daily practices there were no observable differences in the three groups. Thus it is shown that the place of the fractional anticipatory response affects the rate of learning. [15 min., slides.]

ROUND TABLES

WEDNESDAY, SEPTEMBER 3, 4:00 P.M.

The Psychological Bases of National Morale. RENSIS LIKERT, *Chairman.* Room 107, Harris Hall. Arranged by the Program Committee of the Society for the Psychological Study of Social Issues. Participants: Hadley Cantril, Paul F. Lazarsfeld, Margaret Mead, Goodwin Watson.

THURSDAY, SEPTEMBER 4, 4:00 P.M.

Public Opinion. PAUL F. LAZARSFELD, *Chairman.* Room 107, Harris Hall. Arranged by the Program Committee of the Society for the Psychological Study of Social Issues. Participants: Sherman Dryer, Arthur Kornhauser, George Lundberg, Douglas Waples.

Projective Techniques. J. F. BROWN and DAVID RAPAPORT, *Co-Chairmen.* Room 104, University Hall. Participants: Eva Ruth Balken, Samuel J. Beck, Lauretta Bender, Louise Despert, E. Homburger Erikson, Joan Fleming, Eugene L. Horowitz, Mrs. E. L. Horowitz, Bruno Klopfer, Jean Walker Macfarlane, Bela Mittelman, David Shakow.

FRIDAY, SEPTEMBER 5, 4:00 P.M.

The Psychologist in National Defense. WALTER R. MILES, *Chairman.* Room 107, Harris Hall. Participants: To be announced.

BUSINESS MEETINGS AND PRESIDENTIAL ADDRESSES

ANNUAL BUSINESS MEETING

OF THE

**SOCIETY FOR THE PSYCHOLOGICAL STUDY OF
SOCIAL ISSUES**

FLOYD H. ALLPORT, *Chairman*

TUESDAY, SEPTEMBER 2, 7:30 P.M.

ROOM 107, HARRIS HALL

ADDRESS OF THE CHAIRMAN

**SOCIETY FOR THE PSYCHOLOGICAL STUDY OF
SOCIAL ISSUES**

*METHODS IN THE STUDY OF COLLECTIVE ACTION
PHENOMENA: AN INTRODUCTION TO EVENT-SYSTEM
THEORY*

FLOYD H. ALLPORT

SYRACUSE UNIVERSITY

TUESDAY, SEPTEMBER 2, 9:00 P.M.

CAHN AUDITORIUM, SCOTT HALL

ANNUAL BUSINESS MEETING

OF THE

AMERICAN ASSOCIATION FOR APPLIED PSYCHOLOGY

EDGAR A. DOLL, *President*

TUESDAY, SEPTEMBER 2

SESSION I, 9:00 A.M., ROOM 111, SWIFT HALL

SESSION II, 8:00 P.M., ROOM 111, SWIFT HALL

ADDRESS OF THE PRESIDENT

AMERICAN ASSOCIATION FOR APPLIED PSYCHOLOGY

SCIENTIFIC FREEDOM

EDGAR A. DOLL

VINELAND TRAINING SCHOOL

WEDNESDAY, SEPTEMBER 3, 7:00 P.M.

ORRINGTON HOTEL

ANNUAL BUSINESS MEETING

OF THE

PSYCHOMETRIC SOCIETY

JACK W. DUNLAP, *President*

WEDNESDAY, SEPTEMBER 3, 4:00 P.M.

ROOM 100, SPEECH BUILDING

ADDRESS OF THE PRESIDENT
PSYCHOMETRIC SOCIETY*THE PSYCHOMETRIC SOCIETY—ROOTS AND POWERS*

JACK W. DUNLAP

UNIVERSITY OF ROCHESTER

THURSDAY, SEPTEMBER 4, 7:15 P.M.

ANNUAL BUSINESS MEETING

OF THE

AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.

HERBERT WOODROW, *President*

THURSDAY, SEPTEMBER 4, 8:30 P.M.

ROOM 107, HARRIS HALL

ADDRESS OF THE PRESIDENT
AMERICAN PSYCHOLOGICAL ASSOCIATION, INC.*THE PROBLEM OF GENERAL QUANTITATIVE LAWS
IN PSYCHOLOGY*

HERBERT WOODROW

UNIVERSITY OF ILLINOIS

LEONARD CARMICHAEL, *Chairman*

FRIDAY, SEPTEMBER 5, 8:00 P.M.

CAHN AUDITORIUM, SCOTT HALL

The members of the Department of Psychology at Northwestern University will entertain the members of the Association and their guests at an informal reception in the Women's Lounge of Scott Hall after the Presidential Address.

GENERAL ANNOUNCEMENTS, LUNCHEONS, AND DINNERS

Note: Additions and corrections will be posted at Headquarters.

Questions concerning local arrangements should be referred to Dr. A. R. Gilliland, Chairman of the local committee.

Reservations for dormitory accommodations should be sent to Dr. John J. B. Morgan, Psychology Department, Northwestern University, Evanston, Illinois, well in advance of meeting dates, giving specific information as to requirements.

Advance arrangements for luncheon groups can be made by writing to Dr. Grace E. Manson, Personnel Office, Northwestern University, Evanston, Illinois.

Apparatus and books will be exhibited in Room 301, Scott Hall. Persons wishing exhibit space should communicate with Dr. George K. Yacorzynski, Northwestern University Medical School, Evanston, Illinois. Exhibitors will be responsible for packing and unpacking their materials and for the cost of shipment. Reasonable protection will be provided for exhibits, but the University can assume no responsibility for damage or loss.

Questions concerning the program and business meeting of the American Psychological Association should be referred to Dr. Willard C. Olson, Secretary, University of Michigan, Ann Arbor, Michigan.

Questions concerning the program and business meeting of the Psychometric Society should be referred to Dr. Harold A. Edgerton, Secretary, Ohio State University, Columbus, Ohio.

Questions concerning the program and business meeting of the American Association for Applied Psychology should be referred to Dr. C. M. Louttit, Secretary, Department of Psychology, Indiana University, Bloomington, Indiana.

Questions concerning the program and business meeting of the Society for the Psychological Study of Social Issues should be referred to Dr. I. Krechevsky, Secretary-Treasurer, 3929 Ellis Avenue, Chicago, Illinois.

MONDAY, SEPTEMBER 1

The Educational Section of the American Association for Applied Psychology will hold a luncheon and round table on Monday, September 1, at 12:00 o'clock at the Vera Megowen Tea Room.

TUESDAY, SEPTEMBER 2

The Educational Section of the American Association for Applied Psychology will hold a luncheon on Tuesday, September 2, at 12:15 P.M. at the Cradle.

WEDNESDAY, SEPTEMBER 3

A Purdue University luncheon will be held on Wednesday, September 3, at 12:00 o'clock at the Vera Megowen Tea Room.

On Wednesday, September 3, at 12:30 P.M. the Psychological Corporation will hold a luncheon meeting for stockholders, research associates, and guests at the Vera Megowen Tea Room.

The annual dinner of the American Association for Applied Psychology will be held on Wednesday, September 3, at 7:00 P.M. at the Orrington Hotel.

THURSDAY, SEPTEMBER 4

The Iowa luncheon will be held in the Vera Megowen Tea Room on Thursday, September 4, at 12:00 o'clock.

The Rorschach Institute will have a dinner meeting at 6:30 P.M. on Thursday, September 4, for its members and all interested in the Rorschach Method. Reservations at \$1.00 per person may be made with Marguerite R. Hertz, Department of Psychology, Western Reserve University, Cleveland, Ohio.

The Clark Psychologists' dinner will be held on Thursday, September 4, at 6:00 P.M. in the Vera Megowen Tea Room.

The Psychometric Society annual dinner will be held on Thursday, September 4, at 5:45 P.M. The place will be announced. For reservations, write to Harold A. Edgerton, 107 University Hall, Ohio State University, Columbus.

A dinner meeting of the Sir Charles Bell Society will be held Thursday evening, September 4, at 6:00 P.M. The place is to be announced at the information desk.

CONDENSED PROGRAM OF
THE FIFTH ANNUAL PROFESSIONAL CONFERENCE
AND BUSINESS MEETING
OF THE
AMERICAN ASSOCIATION FOR APPLIED PSYCHOLOGY, INC.
MONDAY, TUESDAY, WEDNESDAY, AND THURSDAY
SEPTEMBER 1, 2, 3, 4, 1941

GENERAL SESSIONS

MONDAY

10:00-12:00 A.M. Meetings of Professional Committees.
8:30 P.M. Informal Smoker.

TUESDAY

9:00-12:00 A.M. Business Meeting, Session I, Committee Reports.
8:00-10:00 P.M. Business Meeting, Session II.

WEDNESDAY

7:00- 9:00 P.M. Annual Dinner and Presidential Address.

CLINICAL SECTION

MONDAY

3:00- 4:30 P.M. Business Meeting.

TUESDAY

9:30-11:00 A.M. Clinical Presentation of Case Material.
2:30- 4:00 P.M. Round Table: Psychological Problems of Later
Maturity.

CONSULTING SECTION

MONDAY

5:00- 6:00 P.M. Business Meeting.

TUESDAY

1:30- 3:00 P.M. Round Table: Improving Our Public Relations.
4:00- 6:00 P.M. General Session: Civilian Morale.

EDUCATIONAL SECTION

MONDAY

12:00- 1:30 P.M. Luncheon and Round Table: The Student Per-
sonnel Program in Teacher Training Institu-
tions.
1:30- 3:00 P.M. Business Meeting.
3:30- 6:00 P.M. Excursion to Chicago Bureau of Child Study.

TUESDAY

- 10:30-12:00 A.M. Symposium: The Field of Child Development.
12:15- 2:00 P.M. Luncheon at the Cradle.
2:30- 4:00 P.M. Panel Discussion: Psychological Workers in the
School.

INDUSTRIAL SECTION**MONDAY**

- 1:30- 3:00 P.M. Business Meeting.
4:00- 5:30 P.M. General Session: Applied Psychology in National
Defense.

TUESDAY

- 1:00- 3:00 P.M. Discussion Groups.

NOTES AND NEWS

THE Sixth International Congress for the Unity of Science will be held at the University of Chicago, September 2-6, 1941. There will be a special symposium at one of the morning sessions about Psychology and Scientific Method. Among other sessions are those on Task of the Unification of Science, Communication and the Theory of Signs, Semantics, and Science and Valuation.

Further information may be obtained from Professor Charles W. Morris, Department of Philosophy, University of Chicago, Chicago, Illinois.

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